Vol. 1122 Number 3

OFFICIAL GAZETTE

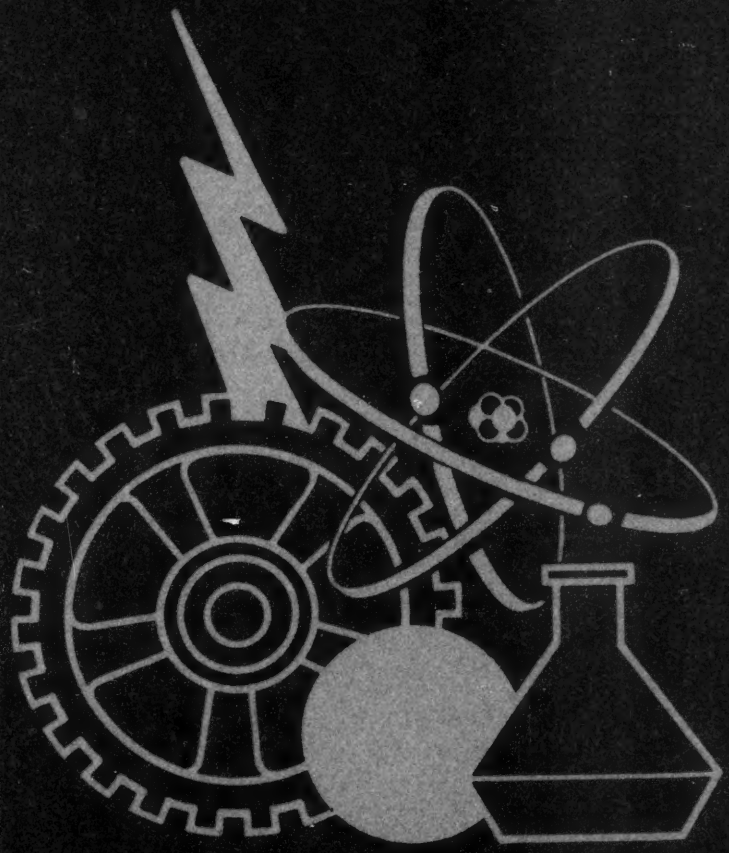
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

January 15, 1991



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

January 15, 1991 Volume 1122 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

[26] In the case of a suggestion for rehearing en banc, we obtain approval from the Solicitor General.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1120 O.G. 14 on Nov. 27, 1990.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed due to a difference in the amount of the fee in German Marks and the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 3, 1991, and was announced in the *Official Gazette* at 1122 O.G. 566 on Jan 1, 1991.

International fees were changed on September 1, 1990 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1116 O.G. 32 on July 17, 1990.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1492.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	502.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	122.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	154.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 6, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on January 12, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,718,122 through 4,719,649
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 10, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,424,595 through 4,425,666
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$850.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 2, 1990 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,687	07/017,612	6/07/88
(4,620,339)	(06/798,960)	(11/04/86)
4,356,574	06/303,158	11/02/82
4,356,585	06/252,166	11/02/82
4,356,588	06/293,278	11/02/82
4,356,637	06/238,150	11/02/82
4,356,640	06/226,459	11/02/82
4,356,641	06/216,557	11/02/82
4,356,646	06/238,496	11/02/82
4,356,647	06/253,795	11/02/82
4,356,648	06/261,886	11/02/82
4,356,649	06/216,613	11/02/82
4,356,656	06/215,715	11/02/82
4,356,660	06/291,782	11/02/82
4,356,680	06/225,063	11/02/82
4,356,687	06/229,095	11/02/82
4,356,700	06/255,907	11/02/82
4,356,730	06/223,522	11/02/82
4,356,753	06/229,461	11/02/82
4,356,779	06/271,643	11/02/82
4,356,784	06/218,833	11/02/82
4,356,790	06/266,084	11/02/82
4,356,796	06/237,114	11/02/82
4,356,813	06/230,526	11/02/82
4,356,847	06/230,917	11/02/82
4,356,866	06/221,725	11/02/82
4,356,869	06/218,248	11/02/82
4,356,881	06/237,868	11/02/82
4,356,884	06/297,868	11/02/82
4,356,927	06/302,195	11/02/82
4,356,952	06/271,696	11/02/82
4,356,953	06/278,162	11/02/82
4,356,986	06/300,651	11/02/82
4,357,044	06/261,659	11/02/82
4,357,094	06/218,898	11/02/82
4,357,102	06/259,835	11/02/82
4,357,107	06/220,507	11/02/82
4,357,135	06/271,037	11/02/82
4,357,153	06/248,884	11/02/82
4,357,174	06/253,393	11/02/82
4,357,182	06/258,822	11/02/82
4,357,197	06/325,130	11/02/82
4,357,200	06/261,780	11/02/82
4,357,201	06/261,921	11/02/82
4,357,202	06/273,272	11/02/82
4,357,217	06/307,926	11/02/82
4,357,221	06/231,719	11/02/82
4,357,227	06/236,479	11/02/82
4,357,228	06/221,672	11/02/82
4,357,246	06/303,162	11/02/82
4,357,247	06/305,532	11/02/82
4,357,252	06/290,762	11/02/82
4,357,253	06/303,161	11/02/82
4,357,255	06/296,391	11/02/82
4,357,264	06/257,300	11/02/82
4,357,277	06/224,128	11/02/82
4,357,279	06/264,593	11/02/82
4,357,289	06/226,759	11/02/82
4,357,295	06/286,402	11/02/82
4,357,305	06/244,571	11/02/82
4,357,315	06/280,276	11/02/82
4,357,316	06/287,901	11/02/82
4,357,319	06/337,738	11/02/82
4,357,329	06/276,406	11/02/82
4,357,337	06/271,065	11/02/82
4,357,339	06/218,629	11/02/82
4,357,340	06/232,730	11/02/82
4,357,346	06/223,469	11/02/82
4,357,387	06/338,853	11/02/82
4,357,388	06/326,875	11/02/82
4,357,392	06/308,060	11/02/82
4,357,396	06/228,444	11/02/82
4,357,398	06/240,673	11/02/82
4,357,402	06/272,234	11/02/82
4,357,420	06/258,350	11/02/82
4,357,444	06/320,982	11/02/82
4,357,450	06/254,383	11/02/82
4,357,453	06/259,324	11/02/82
4,357,454	06/294,719	11/02/82
4,357,455	06/265,793	11/02/82
4,357,470	06/256,780	11/02/82
4,357,472	06/219,172	11/02/82
4,357,497	06/267,405	11/02/82
4,357,511	06/299,440	11/02/82

Patent Number	Serial Number	Issue Date
4,357,536	06/225,492	11/02/82
4,357,540	06/218,322	11/02/82
4,357,592	06/270,006	11/02/82
4,357,646	06/226,654	11/02/82
4,357,689	06/237,195	11/02/82
4,357,699	06/247,489	11/02/82
4,357,711	06/229,765	11/02/82
4,620,323	06/788,766	11/04/86
4,620,324	06/649,140	11/04/86
4,620,327	06/628,168	11/04/86
4,620,330	06/538,895	11/04/86
4,620,331	06/754,611	11/04/86
4,620,332	06/790,897	11/04/86
4,620,333	06/735,846	11/04/86
4,620,335	06/685,041	11/04/86
4,620,346	06/626,120	11/04/86
4,620,350	06/772,969	11/04/86
4,620,359	06/551,254	11/04/86
4,620,367	06/710,393	11/04/86
4,620,387	06/736,253	11/04/86
4,620,389	06/738,278	11/04/86
4,620,391	06/621,443	11/04/86
4,620,395	06/623,565	11/04/86
4,620,404	06/504,363	11/04/86
4,620,409	06/691,437	11/04/86
4,620,421	06/498,390	11/04/86
4,620,427	06/711,408	11/04/86
4,620,441	06/565,046	11/04/86
4,620,451	06/666,518	11/04/86
4,620,452	06/774,472	11/04/86
4,620,456	06/434,972	11/04/86
4,620,457	06/434,971	11/04/86
4,620,461	06/780,164	11/04/86
4,620,468	06/703,367	11/04/86
4,620,471	06/618,474	11/04/86
4,620,472	06/732,682	11/04/86
4,620,476	06/760,092	11/04/86
4,620,483	06/631,807	11/04/86
4,620,484	06/710,538	11/04/86
4,620,486	06/573,511	11/04/86
4,620,489	06/415,172	11/04/86
4,620,499	06/364,447	11/04/86
4,620,502	06/824,512	11/04/86
4,620,505	06/668,468	11/04/86
4,620,514	06/646,448	11/04/86
4,620,525	06/694,931	11/04/86
4,620,526	06/658,785	11/04/86
4,620,528	06/656,872	11/04/86
4,620,529	06/580,634	11/04/86
4,620,535	06/645,243	11/04/86
4,620,537	06/707,827	11/04/86
4,620,544	06/761,678	11/04/86
4,620,551	06/680,603	11/04/86
4,620,552	06/743,672	11/04/86
4,620,553	06/733,857	11/04/86
4,620,576	06/680,364	11/04/86
4,620,577	06/606,437	11/04/86
4,620,579	06/675,544	11/04/86
4,620,580	06/474,656	11/04/86
4,620,581	06/534,420	11/04/86
4,620,602	06/752,459	11/04/86
4,620,603	06/703,111	11/04/86
4,620,628	06/547,036	11/04/86
4,620,630	06/788,932	11/04/86
4,620,631	06/743,301	11/04/86
4,620,642	06/714,004	11/04/86
4,620,652	06/785,866	11/04/86
4,620,653	06/693,542	11/04/86
4,620,658	06/648,167	11/04/86
4,620,661	06/725,673	11/04/86
4,620,668	06/727,315	11/04/86
4,620,672	06/697,985	11/04/86
4,620,676	06/777,754	11/04/86
4,620,682	06/820,474	11/04/86
4,620,683	06/677,498	11/04/86
4,620,684	06/687,521	11/04/86
4,620,687	06/559,737	11/04/86
4,620,691	06/734,913	11/04/86
4,620,695	06/644,990	11/04/86
4,620,697	06/679,463	11/04/86
4,620,700	06/703,188	11/04/86
4,620,702	06/746,134	11/04/86
4,620,706	06/784,268	11/04/86
4,620,707	06/508,111	11/04/86
4,620,716	06/708,246	11/04/86
4,620,722	06/747,307	11/04/86
4,620,727	06/738,493	11/04/86
4,620,728	06/838,391	11/04/86
4,620,730	06/712,034	11/04/86
4,620,731	06/761,461	11/04/86
4,620,739	06/682,692	11/04/86
4,620,740	06/824,455	11/04/86
4,620,743	06/705,327	11/04/86
4,620,746	06/699,785	11/04/86
4,620,753	06/800,818	11/01/86
4,620,756	06/808,713	11/04/86
4,620,774	06/660,291	11/04/86
4,620,778	06/714,280	11/04/86
4,620,796	06/689,931	11/04/86
4,620,803	06/759,238	11/04/86
4,620,808	06/597,922	11/04/86
4,620,809	06/716,196	11/04/86
4,620,810	06/647,131	11/04/86
4,620,819	06/722,757	11/04/86
4,620,836	06/519,767	11/04/86
4,620,843	06/639,491	11/04/86
4,620,847	06/617,506	11/04/86
4,620,849	06/674,061	11/04/86
4,620,850	06/641,134	11/04/86
4,620,867	06/656,068	11/04/86
4,620,869	06/698,107	11/04/86
4,620,871	06/301,822	11/04/86
4,620,891	06/769,636	11/04/86
4,620,904	06/791,574	11/04/86
4,620,906	06/696,934	11/04/86
4,620,907	06/617,595	11/04/86
4,620,918	06/730,097	11/04/86
4,620,923	06/631,257	11/04/86
4,620,953	06/689,640	11/04/86
4,620,957	06/764,510	11/04/86
4,620,970	06/676,849	11/04/86
4,620,971	06/564,411	11/04/86
4,620,984	06/658,705	11/04/86
4,620,985	06/715,102	11/04/86
4,620,989	06/650,327	11/04/86
4,620,997	06/695,722	11/04/86
4,621,000	06/751,668	11/04/86
4,621,002	06/638,281	11/04/86
4,621,003	06/740,964	11/04/86
4,621,009	06/652,637	11/04/86
4,621,024	06/687,997	11/04/86
4,621,026	06/652,601	11/04/86
4,621,054	06/559,760	11/04/86
4,621,060	06/598,340	11/04/86
4,621,062	06/604,810	11/04/86
4,621,078	06/709,483	11/04/86
4,621,080	06/625,945	11/04/86
4,621,081	06/423,555	11/04/86
4,621,084	06/583,609	11/04/86
4,621,089	06/704,621	11/04/86
4,621,106	06/698,535	11/04/86
4,621,141	06/604,189	11/04/86
4,621,151	06/375,686	11/04/86
4,621,166	06/522,977	11/04/86
4,621,167	06/700,980	11/04/86
4,621,168	06/697,206	11/04/86
4,621,170	06/451,945	11/04/86
4,621,171	06/499,555	11/04/86
4,621,176	06/788,514	11/04/86
4,621,181	06/639,326	11/04/86
4,621,188	06/697,425	11/04/86
4,621,192	06/656,329	11/04/86
4,621,193	06/673,587	11/04/86
4,621,205	06/571,974	11/04/86
4,621,215	06/555,873	11/04/86
4,621,216	06/602,852	11/04/86

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4,621,226	06/613,340	11/04/86
4,621,234	06/557,980	11/04/86
4,621,247	06/642,944	11/04/86
4,621,258	06/524,940	11/04/86
4,621,259	06/476,694	11/04/86
4,621,261	06/563,244	11/04/86
4,621,268	06/698,599	11/04/86
4,621,288	06/515,043	11/04/86
4,621,291	06/462,763	11/04/86
4,621,308	06/570,764	11/04/86
4,621,340	06/412,798	11/04/86
4,621,361	06/525,660	11/04/86
4,621,364	06/644,094	11/04/86
4,621,372	06/674,419	11/04/86

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,064,376, Re. S. N. 07/526,540, Filed May 21, 1990, Cl. 381/152, SOUND REPRODUCTION SYSTEM AND DEVICE, Kyoto Yamada, Owner of Record: *Bodysonic Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: James C. Wray, Ex. Gp.: 235

4,644,425, Re. S. N. 07/538,690, Filed June 15, 1990, Cl. 360/69, CONTROL APPARATUS FOR CONTROLLING, Isao Tamaki, Owner of Record: *Sony Corp., Tokyo, Japan,* Attorney or Agent: Donald S. Dowdon, Ex. Gp.: 235

4,698,553, Re. S. N. 07/620,448, Filed Dec. 3, 1990, Cl. 315, ELECTRONIC POWER SUPPLY SYSTEM, Ole K. Nilssen, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 266

4,764,704, Re. S. N. 07/566,686, Filed Aug. 13, 1990, Cl. 313/126, IGNITER PLUG WITH VIBRATION DAMPING MEANS, Helmut P. Meyer, Owner of Record: *Unison Industries Limited Partnership, Rockford, Ill.,* Attorney or Agent: John B. Conklin, Ex. Gp.: 266

4,778,620, Re. S. N. 07/599,442, Filed Oct. 18, 1990, Cl. 252/299.630, TOLAN DERIVATIVE AND A LIQUID CRYSTAL MIXTURE CONTAINING THE SAME, Yasuyuki Goto, et al., Owner of Record: *Chisso Corp., Osaka, Japan,* Attorney or Agent: Herbert C. Rose, Ex. Gp.: 223

4,788,383, Re. S. N. 07/617,341, Filed Nov. 23, 1990, Cl. 174/54, ELECTRICAL JUNCTION BOX FOR SUPPORT OF A HANGING APPLIANCE, Gregory W. Caison, et al., Owner of Record: *Fasco Industries, Inc., Boca Raton, Fla.,* Attorney or Agent: Phillip K. Fitzsimmons, Ex. Gp.: 213

4,789,767, Re. S. N. 07/618,420, Filed Nov. 27, 1990, Cl. 219/9, AUTOREGULATING MULTI CONTACT INDUCTION HEATER, Frank A. Doljack, Owner of Record: *Metcal, Inc., Menlo Park, Calif.,* Attorney or Agent: Howard L. Rose, Ex. Gp.: 216

4,820,822, Re. S. N. 07/619,558, Filed Nov. 29, 1990, Cl. 546/118, NOVEL N-(BICYCLIC HETEROCYCLYL)-4-PIPERIDINAMINES, Frans E. Janssens, Owner of Record: *Janssen Pharmaceutica, N.V., Beerse, Belgium,* Attorney or Agent: Charles F. Metz, Ex. Gp.: 121

4,881,407, Re. S. N. 07/620,736, Filed Dec. 3, 1990, Cl. 73/204.160, HOT WIRE FLOW METER, Minoru Takahashi, et al., Owner of Record: *Hitachi Ltd., Hitachi Automotive Engineering Co., Ltd., Katsuta-Shi, Japan,* Attorney or Agent: Donald R. Antonelli, Ex. Gp.: 265

4,888,139, Re. S. N. 07/619,363, Filed Nov. 28, 1990, Cl. 562/840, PROCESS FOR PREPARING CHF2OCHFCF3 AND CHF2OCHCLCF3 INTERMEDIATE COMPOUNDS EMPLOYED THEREIN, Donald F. Halpern, et al., Owner of Record: *Anaquest, Inc., Mendham, N.J.,* Attorney or Agent: R. Hain Swope, Ex. Gp.: 126

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,921,888, Reexam. No. 90/002,210, Requested Nov. 27, 1990, Cl. 228/180.100, WAVE SOLDERING OF PRINTED CIRCUITS, Donald A. Elliot, et al., Owner of Record: *Electrovert, Ltd., Montreal, Quebec, Canada,* Attorney or Agent: Peter C. Schecter, Darby & Darby, New York, N.Y., Ex. Gp.: 325, Requester: Warren A. Sklar, Renner, Otto, Boisselle & Sklar, Cleveland, Ohio

4,457,664, Reexam. No. 90/002,215, Requester: Nov. 30, 1990, Cl. 414/779, WAFER ALIGNMENT STATION, Neil H. Judell, et al., Owner of Record: *Ade Corp., Newton, Mass.,* Attorney or Agent: Weingarten, Schurgin, Gagnebin & Hayes, Boston, Mass., Ex. Gp.: 317, Requester: Venable, Baetjer, Howard & Civiletti, Washington, D.C.

4,570,739, Reexam. No. 90/002,216, Requested Nov. 30, 1990, Cl. 180/216, PERSONAL MOBILITY VEHICLE, Duwayne E. Kramer, Owner of Record: *Burke, Inc., Mission, Kans.,* Attorney or Agent: Linde, Thomson, et al., Overland Park, Kans., Ex. Gp.: 316, Requester: Pride Health Care, Inc., Pittston, Pa.

4,604,097, Reexam. No. 90/002,217, Requested Dec. 5, 1990, Cl. 623/011, BIOABSORBABLE GLASS FIBERS FOR USE IN THE REINFORCEMENT OF BIOSBSORBABLE POLYMERS FOR BONE FIXATION DEVICES AND ARTIFICIAL LIGAMENTS, George A. Graves, Jr., et al., Owner of Record: *University of Dayton, Dayton, Ohio,* Attorney or Agent: Richard A. Killworth, Dayton, Ohio, Ex. Gp.: 153, Requester: Owner

4,717,268, Reexam. No. 90/002,211, Requested Nov. 27, 1990, Cl. 384/280, BEARING CONSTRUCTION, Stanley S. Orkin, Owner of Record: *Kamatics Corp., Bloomfield, Conn. & Stanley S. Orkin, Vernon, Conn.,* Attorney or Agent: Cushman, Darby & Cushman, Washington, D.C., Ex. Gp.: 245, Requester: Owner

4,881,259, Reexam. No. 90/002,214, Requester: Nov. 30, 1990, Cl. 379/058, ANSWERING MACHINE WITH CORDLESS TELEPHONE, James Scordato, Owner of Record: *Dynascan Corp., Chicago, Ill.,* Attorney or Agent: Wallenstein, Wagner & Hattis, Chicago, Ill., Ex. Gp.: 261, Requester: Keith E. George, Lowe, Price, LeBlanc, et. al., Alexandria, Va.

Availability of PatentIn Computer Program Training Tuesday, January 22, 1991 and Wednesday, January 23, 1991

The Patent and Trademark Office (PTO) has developed a computer program, called PatentIn, that will facilitate compliance with the Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures

(sequence rules: 37 CFR 1.821 through 1.825). (Final rules were published in the *Federal Register*, 55 Fed. Reg. 18?30 (May 1, 1990), and in the *Official Gazette*, 1114 O.G. 29 (May 15, 1990).)

Two one day training sessions will be held on the use of the PatentIn Computer Program on Tuesday, January 22, 1991 and Wednesday, January 23, 1991 from 10:00 am to 4:00 pm. The training will be held at the Department of Agriculture Graduate School Training Facility. The School is located at 600 Maryland Ave., S.W. Washington, D.C. at the L'Enfant Plaza Metro stop.

The training will be hands on, using personal computer equipment and will include (1) the use of PatentIn to prepare the sequence listing file of information, and (2) the use of word processing software to prepare the PatentIn sequence listing file for inclusion as part of the application papers. The class will also include training on the basic file editing and manipulation skills that may be necessary for preparing sequence information for importing into PatentIn.

Because of the limited number of computers available, each class will be limited to no more than 18 participants.

Requests to attend the class should be made in writing, addressed to the Commissioner of Patents and Trademarks, Washington, D.C., Attention: Lois E. Boland; Special Program Examiner, Office of the Assistant Commissioner for Patents-Crystal Park 2, Suite 919. Requests should include a check for $100 or the requisite authorization to charge a PTO Deposit Account. Requests authorizing charges to PTO Deposit Accounts may also be sent via facsimile to 703-557-8331. Any questions about the sequence rules or this notice should be directed to Lois E. Boland, by telephone at (703) 557-8384.

WILLIAM S. LAWSON
Administrator for Documentation

Availability of PatentIn Computer Program and Policy Regarding Enforcement of the Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosure

The Patent and Trademark Office (PTO) has developed a computer program, called PatentIn, that will facilitate compliance with the Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures (sequence rules: 37 CFR §§ 1.821 through 1.825). (Final rules were published in the *Federal Register*, 55 Fed. Reg. 18230 (May 1, 1990), and in the *Official Gazette*, 1114 O.G. 29 (May 15, 1990).)

The PatentIn program is now available. The program is only available for IBM PC XT, AT, PS/2 and compatible systems, having hard disk drives. Installation of PatentIn on a hard disk requires a minimun of 1.2 megabytes free disk space. The program further requires a PC with 550 kilobytes free in RAM (random access memory). The program is available on 3 1/2" or 5 1/4" diskettes. While the PatentIn program is not intended to be the sole means for complying with the sequence rules, it should be noted that it was designed to facilitate compliance with all of the mandatory and optional requirements of the rules.

The PTO did not receive the final version of the PatentIn program until after the effective date of the sequence rules. In view of this delay, the PTO has delayed sending notices to comply with the sequence rules in those applications filed that have not attempted to comply with the rules. Although the effective date of the sequence rules remains October 1, 1990, and all applications filed on or thereafter must eventually comply with the rules, a grace period with respect to enforcement of the rules for most applications will be in effect until February 15, 1991. At that time, notices to comply will be mailed in all applications, containing nucleotide sequence and/or amino acid sequence disclosures filed on or after October 1, 1990, that have not complied or do not comply with the rules.

Requests for copies of the PatentIn program and associated materials should be made in writing, addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Lois E. Boland; Special Program Examiner, Office of the Assistant Commissioner for Patents-Crystal Park 2, Suite 919. Requests should include a check for $480.00 or the requisite authorization to charge a PTO Deposit Account. If applicable, requests should also specify diskette size. Any questions about the sequence rules or this notice should be directed to Lois E. Boland, by telephone, at (703) 557-8384.

Dec. 19, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

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Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Mega Products International, Inc., Lakewood, Colo., Reg. No. 1,381,608, for the mark "EQUALIZER", Canc. No. 18,752

Harrington & Richardson, Inc., Worcester, Mass., Reg. No. 921,805, for the mark "ULTRA WILDCAT", Canc. No. 18,813

InterWest Financial Corp., Denver, Colo., Reg. No. 1,333,582, for the mark "FIRST DENVER INSURANCE", Canc. No. 18,856

JEAN BROWN
Administrator, Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,506,016, Bertram Flehmig, HEPATITIS-A VIRUSES ADAPTED TO HUMAN FIBROBLAST CELLS, Interference No. 101,584, decided July 17, 1989, claims 1-4 and 7-9.

Patent No. 4,543,643, Kenji Shibazaki, Yutaka Irie, Masazumi Ito, Tomoji Murata, COPYING MAGNIFICATION SETTING DEVICE FOR AN ELECTROPHOTOGRAPHIC COPYING APPARATUS, Interference No. 101,882, decided Aug. 20, 1990, claims 1-11 and 13-27.

Patent No. 4,648,455, Mike A. Luke, METHOD AND APPARATUS FOR STEAM INJECTION IN SUBTERRANEAN WELLS, Interference No. 102,042, decided Oct. 9, 1990, claims 1-3, 5-6, 7/1, 7/6, 9, 10, 11, 12/10, 12/11, 14, 15/10, 15/11, 15/14, 16/10, 16/11, 16/14, 20-22, 23/20, 23/21, 23/22, 24/20, 24/21 and 24/22.

Patent No. 4,675,321, John J. Baldwin, Steven M. Pitzenberger, David E. McClure, SUBSTITUTED PYRIMIDINES USEFUL AS CALCIUM CHANNEL BLOCKERS, Interference No. 102,354, decided Oct. 31, 1990, claims 1-9.

Patent No. 4,680,618, Toshio Kuroda, Koichi Kumazawa, PACKAGE COMPRISING A COMPOSITE METAL BODY BROUGHT INTO CONTACT WITH A CERAMIC MEMBER, Interference No. 102,422, decided Oct. 19, 1990, claims 1 and 2.

Patent No. 4,693,563, Takamasa Harada, Masaaki Taguchi, FERROELECTRIC LIQUID CRYSTAL ELECTRO-OPTICAL DEVICE, Interference No. 102,091, decided Nov. 16, 1990, claims 1-20.

Patent No. 4,712,908, Tomobumi Nakayama, Toshihiko Mori, Masayuki Hirose, Toru Ohbuchi, Masanori Miyata, Shin-

ichi Nakamura, Takeshi Honjo, IMAGE FORMING APPARATUS, Interference No. 102,411, decided Nov. 9, 1990, claims 5-7.

Patent No. 4,724,448 Keisuke Maeda, Yoshinobu Kudo, FIXED-FOCUS AMPHIBIOUS CAMERA, Interference No. 102,394, decided Sept. 25, 1990, claims 1 and 2.

Patent No. 4,725,129, Katsumi Kondo, Yoshiharu Nagae, METHOD OF DRIVING A FERROELECTRIC LIQUID CRYSTAL ELEMENT, Interference No. 102,092, decided Nov. 16, 1990, claims 1-10.

Patent No. 4,739,840, Bobby E. Cox, METHOD AND APPARATUS FOR PROTECTING A SHALLOW WATER WELL, Interference No. 102,322, decided Nov. 6, 1990, claims 1-4, 8, 13, 15, 17 and 18.

Patent No. 4,749,717, Lawrence I. Kruse, DOPAMINE-BETA-HYDROXYLASE INHIBITORS, Interference No. 102,379, decided Nov. 20, 1990, claims 1-6.

Patent No. 4,758,422, Steven C. Quay, FERRIOXAMINE PARAMAGNETIC CONTRAST AGENTS FOR MR IMAGING, Interference No. 102,373, decided Oct. 3, 1990, claims 1-5, 7, 9 and 10.

Patent No. 4,806,961, Masatoshi Kamitani, Manabu Inoue, Motohiro Nakanishi, Hiroshi Ootsuka, Yoshinobu Kudo, Yoshiaki Hata, PHOTOGRAPHIC CAMERA, Interference No. 102,424, decided Nov. 15, 1990, claims 1-14.

Patent No. 4,831,184, Raymond D. Youssefyeh, Jerry W. Skiles, John T. Suh, Howard Jones, N-SUBSTITUTED-AMIDO-AMINO ACIDS, Interference No. 101,374, decided Nov. 6, 1990 claims 1-9, 11, 14 and 16.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent
Appeals and
Interferences
(703) 557-4005

PATENT NOTICES

Certificates of Correction For Week of January 15, 1991

D. 305,358	4,859,253	4,881,688	4,891,812
D. 305,562	4,859,886	4,882,118	4,893,639
Re. 33,009	4,861,516	4,882,226	4,893,861
4,627,727	4,862,162	4,882,292	4,893,941
4,666,839	4,863,088	4,882,425	4,894,029
4,678,658	4,863,164	4,882,673	4,894,159
4,747,125	4,864,797	4,883,715	4,894,231
4,762,268	4,866,241	4,883,846	4,894,606
4,782,381	4,866,892	4,884,549	4,895,639
4,785,089	4,866,958	4,884,597	4,895,821
4,797,484	4,871,445	4,884,678	4,895,995
4,805,839	4,872,051	4,885,190	4,896,398
4,817,010	4,872,238	4,885,281	4,896,562
4,818,703	4,872,553	4,885,339	4,897,112
4,819,467	4,873,278	4,885,459	4,897,143
4,823,081	4,874,018	4,885,724	4,897,144
4,824,671	4,874,354	4,886,688	4,897,611
4,829,283	4,875,288	4,886,786	4,898,083
4,829,776	4,875,333	4,886,789	4,898,978
4,830,773	4,875,340	4,887,459	4,899,556
4,834,400	4,875,385	4,887,817	4,900,161
4,835,488	4,875,519	4,887,845	4,900,550
4,842,115	4,875,547	4,888,281	4,900,564
4,842,162	4,875,760	4,888,369	4,900,604
4,843,003	4,875,914	4,888,717	4,901,766
4,843,319	4,876,086	4,889,280	4,903,558
4,843,806	4,876,636	4,889,458	4,904,896
4,844,185	4,876,638	4,889,560	4,906,249
4,846,192	4,876,743	4,890,184	4,907,261
4,846,992	4,876,998	4,890,625	4,908,558
4,847,382	4,877,409	4,890,739	4,912,986
4,848,936	4,877,634	4,890,770	4,914,905
4,849,163	4,878,012	4,890,837	4,930,757
4,851,242	4,879,740	4,890,853	4,932,994
4,852,524	4,880,545	4,890,959	4,963,148
4,853,080	4,880,769	4,891,340	
4,854,586	4,880,787	4,891,541	
4,859,045	4,881,220	4,891,561	

Disclaimers

4,664,920.—*Fouad Z. Saleeb,* Pleasantville, N.Y.; *Randal P. McKay,* Paramus, N.J. METHOD FOR FIXING FOOD INGREDIENTS ON A MAGNESIUM SALT SUBSTRATE. Patent dated May 12, 1987. Disclaimer filed Nov. 30, 1990, by the assignee, Kraft General Foods, Inc.

The term of this patent subsequent to Sept. 19, 1990, has been disclaimed.

4,766,062.—*Steven E. Diamond,* Springfield; *Joseph G. Brewen,* Convent Station; *Jon I. Williams,* Montclair; *Marian S. Ellwood,* Summit, all of N. J.; *Mary Collins,* Watertown; *Edward F. Fritsch,* Concord, both of Mass. DISPLACEMENT POLYNUCLEOTIDE ASSAY METHOD AND POLYNUCLEOTIDE COMPLEX REAGENT THEREFOR. Patent dated Aug. 23, 1988. Disclaimer filed Sept. 26, 1990, by the assignee, Allied-Signal, Inc. and Genetics Institute, Inc.

Hereby enters this disclaimer to claims 48 and 49 of said patent.

4,795,647.—*Kevin J. Leibfred,* Oakland, N. J. CONTINUOUS PRODUCTION OF SHELF-STABLE MULTI-TEXTURED SHREDDED CEREAL BISCUITS HAVING A PASTE FILLING. Patent dated Jan. 3, 1989. Disclaimer filed Nov. 1, 1990, by the assignee, Nabisco Brands, Inc.

The term of this patent subsequent to Sept. 29, 2004, has been disclaimed.

4,830,327.—*Garry G. L. Fimeri,* Lonsdale, Australia. REAR VISION MIRROR ADJUSTING MEANS. Patent dated May 16, 1989. Disclaimer filed Oct. 10, 1990, by the assignee, Britax Rainsford Pty. Ltd

The term of this patent subsequent to July 23, 1990, has been disclaimed.

4,871,295.—*Uri Kaplan,* Rehovot, Isreal. MODULAR RAKINE CYCLE VAPOR TURBINE. Patent dated Oct. 3, 1989. Disclaimer filed Jan. 30, 1990, by the assignee, Ormat Turbines (1965) Ltd.

The term of this patent subsuquent to Aug. 27, 2002, has been disclaimed.

Dedications

4,444,829.—*P. Stuart Bollen,* Auburn; *Alfieri Degrassi,* Pottsville, both of Pa.; William Sacks, Gillette, N.J. POLYAMIDE RELEASE FILM FOR SHEET MOLDING COMPOUND. Patent dated Apr. 24, 1984. Dedication filed July 5, 1990, by the assignee, Allied Signal Inc.

Hereby dedicated to the Public the remaining term of said patent.

4,568,505.— *P. Stuart Bollen,* Auburn; *Alfieri Degrassi,* Pottsville, both of Pa.; *William Sacks,* Gillette, N.J. PROCESS TO PRODUCE SHEET MOLDING COMPOUND USING A POLYAMIDE RELEASE FILM. Patent dated Feb. 4, 1986. Dedication filed July 5, 1990, by the assignee, Allied-Signal Inc.

Hereby dedicates to the Public the remaining term of said patent.

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue.
Box ITU	All Intent to Use documents excluding the initial application and amendments to allege use.
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Box Pat. Ext.	Applications for patent term extension.
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Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.
Box SEQUENCE	All application papers, computer readable forms and fees related to applications containing nucleotide sequence and/or amino acid sequence disclosures in accordance with 37 CFR §§ 1.821 through 1.825.

Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to libary, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8847
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa: Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	Not Yet Operational
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
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	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
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	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada-Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
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North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	Not Yet Operational
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372

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	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
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Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF December 1, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.	7-15-87
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director.	11-21-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director	2-27-89
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-31-89
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	12-18-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—ROBERT E. GARRETT, Director	11-2-88
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	7-29-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX,Director	5-18-89
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director.	2-27-89
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 STEWART LEVY, Acting Director	1-2-89
DESIGN, GROUP 290—ROBERT E. GARRETT, Director	6-16-87
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	12-7-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	4-10-89
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	7-24-89
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	5-31-89
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director	10-1-89

Expiration of patents: The patents within the range of numbers indicated below expire during December 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,775,774 to 3,778,913 inclusive
Plant Patents ..... none

REEXAMINATIONS

JANUARY 15, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,138,670 (1403rd)

A.C. POWERED DETECTING DEVICE WITH BATTERY BACKUP

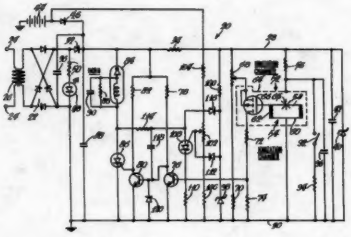
Quentin L. Schneider, Bensenville, and Richard J. Schwarzbach, Naperville, both of Ill., assignors to Pittaway Corp., Northbrook, Ill.

Reexamination Request No. 90/001,930, Feb. 2, 1990.

Reexamination Certificate for Patent No. 4,138,670, issued Feb. 6, 1979, Ser. No. 756,494, Jan. 3, 1977.

Int. Cl.[5] G08B *29/00, 17/10*

U.S. Cl. 340—507



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–29 is confirmed.

1. In a warning device, means for connecting with power from a first source thereof; means for connecting with power from a second source thereof, said second source comprising a battery; means for emitting a signal, said emitting means having an active state in which said signal is emitted and an inactive state in which said signal is not emitted; means for detecting the presence of predetermined phenomena; means responsive to said detecting means for placing said emitting means in said active state, means for monitoring the output voltage of said battery and for placing said emitting means in said active state when said voltage equals a first predetermined value; and means for applying power from said first source thereof to said emitting means, said detecting means, said responsive means and said monitoring means, and for applying power thereto from said second source thereof upon interruption of power from said first source.

B1 4,379,696 (1404th)

LATEX MYLAR CHIP

Stanley Lerner, Highland Park, Ill., assignor to Color Communications, Inc., Chicago, Ill.

Reexamination Request No. 90/001,658, Dec. 1, 1988.

Reexamination Certificate for Patent No. 4,379,696, issued Apr. 12, 1983, Ser. No. 233,843, Feb. 12, 1981.

Int. Cl.[5] G09F *7/00*; A44B *7/00*

U.S. Cl. 434—98

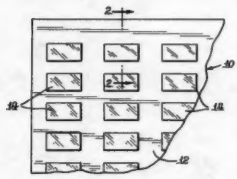
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1 to 10 and 12 is confirmed.

Claim 11 is determined to be patentable as amended.

New claims 13–22 are added and determined to be patentable.

1. A color sample display device capable of being produced with an automated apparatus, said display device comprising a



plurality of color swatches consisting essentially of polyethylene terephthalate film having a thickness of from about ¼ mil to about 7 mils, a paint coating on the surface of said film;

an adhesive on said coating or unpainted surface of said film; and

a base sheet with said color swatched adhesively affixed thereto.

B1 4,821,492 (1405th)

METHOD OF MAKING END FILL MICROWAVABLE AND/OR OVENABLE CONTAINER

Donald R. Prater, Beaverton, Oreg., assignor to James River Norwalk, Inc.

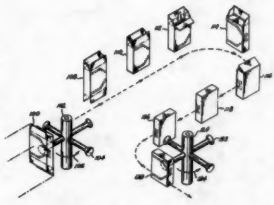
Reexamination Request No. 90/002,008, Apr. 26, 1990.

Reexamination Certificate for Patent No. 4,821,492, issued Apr. 18, 1989, Ser. No. 156,406, Feb. 16, 1988.

Division of Ser. No. 40,255, Apr. 20, 1987, Pat. No. 4,746,019

Int. Cl.[5] B65B *7/20, 43/26*

U.S. Cl. 53—458



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–17 is confirmed.

1. A method for assembling from a pre-cut blank, a container, which is filled with a product through an open end and which is made with a waterproof material suitable for holding the product while it is heated in an oven, the pre-cut blank including a tray portion on which scored fold lines define a first panel, a front sidewall, a first and a second end wall, and four gusseted corners; and a cover portion connected to the tray portion by a rear sidewall defined by scored fold lines, also defining on the cover portion a front flap, and a first and a

second end flap, the cover portion including a tearopen access flap, the method comprising the steps of:

folding the blank along one of the fold lines that define the rear sidewall, so that the tray portion at least partially overlies the cover portion;

folding one of the front sidewall and the front flap over the other thereof and adherently securing and sealing it thereto;

orienting the blank so that the first panel, the cover portion, the rear sidewall, and the front flap are all substantially vertical, the end walls and the end flaps being disposed at the top and the bottom of the blank;

folding the blank along the fold lines so that it assumes a generally box-like shape having two open ends, and four sides;

folding one of the first end flap and first end wall over one of the open ends;

folding the other of the first end flap and first end wall over the one and adherently securing and sealing it thereto, thereby closing one end;

after the container is filled through the other end that is open, folding one of the second end flap and second end wall over the other; and

folding the other of the second end flap and the second end wall over the one thereof, adherently securing and sealing it thereto.

REISSUES

JANUARY 15, 1991

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,518

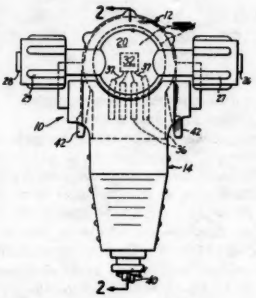
PRESSURE TRANSDUCER ASSEMBLY

Kenneth R. McCord, Yorba Linda; James K. Bullock, Burbank; Keith Gilroy, Upland; Henrick K. Gille, Monrovia; Edward J. Arkans, Sunland, and Paul Anderson, Tujunga, all of Calif., assignors to Baxter International, Inc., Deerfield, Ill.

Original No. 4,539,998, dated Sep. 10, 1985, Ser. No. 489,900, Apr. 29, 1983. Application for reissue Sep. 10, 1987, Ser. No. 95,416

Int. Cl.[5] A61B *5/215*

U.S. Cl. 128—675 **58 Claims**



50. A pressure transducer assembly for monitoring pressure in a fluid comprising:

a housing defining a chamber and having an inlet port and an outlet port in fluid-flow communication with the chamber;

an insulated body sealed within the chamber which forms separate first and second chambers within the housing with the first chamber in fluid-flow communication with the inlet port and outlet port and adapted to be filled with fluid from the inlet port;

a pressure transducer means secured on the insulated body and exposed to pressure of fluid in the first chamber for determining and converting fluid pressure within a fluid adapted to be in the first chamber into electrical impulses;

temperature compensation means for compensating the sensed pressure in the fluid based upon the temperature of the fluid and correcting such sensed pressure;

a fluid pressure responsive media which is electrically nonconductive and which separates the pressure transducer means from any fluid present in the first chamber; and

an electrical conductor connected to the pressure transducer means.

Re. 33,519

METHOD AND APPARATUS FOR CONTROLLING INDUCTION MOTOR

Satoshi Ibori, Funabashi; Tadao Shimotu, Sakura, and Masatomo Yabu, Itikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Keiyo Engineering Co., Ltd., Chiba, both of, Japan

Original No. 4,689,542, dated Aug. 25, 1987, Ser. No. 773,579, Sep. 9, 1985. Application for reissue Aug. 22, 1989, Ser. No. 397,174

Claims priority, application Japan, Sep. 13, 1984, 59-190514

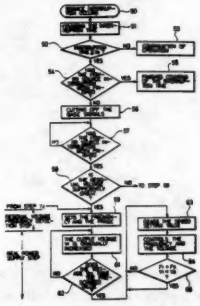
Int. Cl.[5] H02P *1/26, 5/40*

U.S. Cl. 318—778 **45 Claims**

1. In a method of actuating an induction motor rotating inertially by supplying power to said induction motor from power conversion means capable of changing both the output frequency F_1 and the output voltage V_1 thereof, a control method of an induction motor comprising the steps of:

(a) a tentative power supply step for applying power necessary for said induction motor to generate a residual voltage above a predetermined value V_2 for a predetermined period Ta, to said induction motor during a later-appearing power supply interruption step;

(b) said power supply interruption step for interrupting the power supply to said induction motor after said tentative power supply step;



(c) a residual voltage frequency detection step for detecting the frequency fm of a residual voltage of said induction motor within said period Ta after the interruption of power supply in said power supply interruption step; and

(d) a real power supply step for supplying power having a frequency corresponding to the frequency fm of said residual voltage determined by said residual voltage frequency detection step, to said induction motor from said power conversion means.

Re. 33,520

DOT MATRIX PLASMA DISPLAY AND METHOD FOR DRIVING SAME

Herman R. Person; Joseph F. Hesse, and Steven R. Hall, all of Columbus, Nebr., assignors to Dale Electronics, Inc., Columbus, Nebr.

Original No. 4,450,441, dated May 22, 1984, Ser. No. 296,790, Aug. 27, 1981. Application for reissue Oct. 26, 1988, Ser. No. 263,780

Int. Cl.[5] G09G *3/28*

U.S. Cl. 340—773 **12 Claims**

1. A direct current dot matrix digital display device comprising:

a dielectric substrate having a flat upper surface,

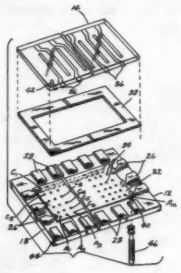
a plurality of elongated cathode strips mounted on the upper surface of said substrate and being arranged in parallel spaced relation to one another,

a printed dielectric layer on said substrate and said cathode strips and having a plurality of openings therethrough each communicating with a portion of said cathode strips, said openings being formed in rows and columns to form a matrix, [and] *said* rows of openings each being aligned over one of said [cathod] *cathode* strips,

a transparent top plate having an under surface and sealed to the perimeter of said substrate by sealing means and positioned above and in spaced relation to said dielectric layer to create an envelope of space above, in communication with, and completely enveloping said matrix of openings;

a plurality of elongated anode strips mounted on the undersurface of said top plate within said envelope of space and in spaced relation to said dielectric layer, said anode strips extending perpendicular and above said cathode strips and each being spaced above and in registered alignment with one of said columns in said matrix of openings in said dielectric layer,

a mass of ionizable gas filling said envelope of space and said matrix of openings in said dielectric layer whereby said anode strips are all in direct contact with said mass of ionizable gas,



said dielectric layer covering all portions of said cathode strips and said upper surface of said substrate within said envelope between said matrix of openings;

said anode strips and said cathode strips being the only electrodes positioned in alignment with said matrix of openings,

said envelope being substantially free of barriers between said rows and column of openings, and

terminal means for said anode and cathode strips.

Re. 33,521

METHOD AND APPARATUS FOR DETECTING A FAULTY COMPUTER IN A MULTICOMPUTER SYSTEM

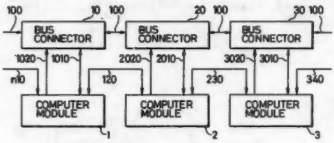
Kinji Mori, Kawasaki, and Hirokazu Ihara, Machida, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,486,829, dated Dec. 4, 1984, Ser. No. 363,841, Mar. 31, 1982. Application for reissue Dec. 4, 1986, Ser. No. 938,034

Claims priority, application Japan, Apr. 3, 1981, 56-49315

Int. Cl.[5] **G06F** *11/20, 13/40, 15/16*

U.S. Cl. 364—200 **21 Claims**



10. A data transmission system comprising:

at least one transmission medium; and

a plurality of equipments which are connected to said transmission medium and each of which has (A) connector means connected through said transmission medium to other equipments and including at least one gate means for selectively passing a signal from one of the equipments to another one and, (B) processing means connected to said connector means and including (B1) means for checking a condition of a path including at least one of said other equipments and said transmission medium connected thereto to detect a fault in the path at any time independently of operations of and in parallel with other equipments and (B2) means responsive to said checking means for controlling said gate means of said connector means independently of other equipments so as to prevent said signal from passing through at least one of said gate means when a fault is detected as a result of the checking by said checking means.

PLANT PATENTS

GRANTED JANUARY 15, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,418
MINIATURE ROSE PLANT NAMED SAVARITA

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Sep. 20, 1989, Ser. No. 410,309
Int. Cl.[5] A014 *5/00*
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by attractive bright pink flowers opening to old garden rose form.

7,419
PECAN TREE NAMED 'JAMES EARLY' VARIETY

George W. James, and George W. James, II, both of Brunswick, Mo., assignors to James Pecan Farms, Inc., Brunswick, Mo.

Filed Nov. 13, 1989, Ser. No. 435,279
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—31 1 Claim

1. A new and distinct variety of pecan tree having a sturdy upright and spreading growth habit and excellent hardiness which bears in abundance quality nuts which mature 10 to 15 days earlier than the James variety (U.S. Plant Pat. No. 1,361), substantially as illustrated and described.

7,420
INTERSPECIFIC TREE "FLAVOR QUEEN"

Chris F. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Oct. 27, 1989, Ser. No. 427,863
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of interspecific tree, as illustrated and described, characterized by its large size, vigorous, semi-spreading growth and a productive and regular bearer of large, firm, yellow flesh, clingstone fruit; the fruit is further characterized by staying firm on the tree 12 to 15 days after maturity, having excellent flavor and eating quality with a high degree of soluble solids (average 18.1 Brix) and having good storage quality.

7,421
NECTARINE TREE (ROSE DIAMOND)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Dec. 26, 1989, Ser. No. 457,184
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of freestone nectarine tree, substantially as illustrated and described, which most closely resembles its seed parent, Early Diamond (U.S. Plant Pat. No. 5,438), by producing fruit that is almost fully red in skin color, freestone in type, firm in texture, and excellent in flavor, but is distinguished therefrom and an improvement thereon by producing fruit that ripens two days later, that is larger in size, and that is less prone to split-pitting.

7,422
GERANIUM PLANT NAMED FISRIX

Ingeborg Schumann, Hoehr-Grenzhausen, Fed. Rep. of Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Oct. 25, 1989, Ser. No. 426,223
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Geranium plant named Fisrix, as illustrated and described.

7,423
CHRYSANTHEMUM PLANT NAMED YELLOW ENVY

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 2, 1989, Ser. No. 388,893
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—78 1 Claim

1. A new and distinct Chrysanthemum plant named Yellow Envy, as described and illustrated.

PATENTS

GRANTED JAN. 15, 1991

ERRATA

For CLASS	See PATENT NO.
439-259	4,984,383
047-009	4,984,384
081-081	4,984,503
297-016	4,984,768
270-030	4,984,772
270-005	4,984,773
267-276	4,984,776
267-140	4,984,777
272-069	4,984,810
279-001	4,984,844
350-332	4,984,887
360-092	4,984,897
043-042	4,984,950
029-888	4,984,966
439-131	4,984,982
606-148	4,985,038
560-130	4,985,198
376-442	4,985,199
419-019	4,985,200
546-256	4,985,558
357-023	4,985,717
357-023	4,985,718
335-299	4,985,735
346-160	4,985,823

PATENTS

GRANTED JANUARY 15, 1991

GENERAL AND MECHANICAL

4,984,299

CUFF FOR USE WHEN WORKING WITH LIQUID MATERIAL AT A LEVEL ABOVE SHOULDER HEIGHT

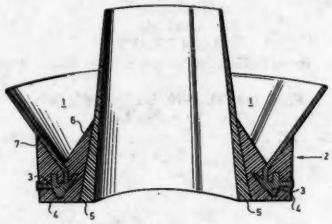
Hildur Halldórsdóttir, P.O. Box 355, Götene, Sweden

PCT No. PCT/SE88/00127, § 371 Date Sep. 20, 1989, § 102(e) Date Sep. 20, 1989, PCT Pub. No. WO88/08260, PCT Pub. Date Nov. 3, 1988

PCT Filed Mar. 11, 1988, Ser. No. 399,509

Int. Cl.[5] A41B *7/00, 7/12*

U.S. Cl. 2—16 **10 Claims**



1. A protective cuff for preventing a liquid material from flowing downwardly along an arm of a user of the liquid material when work is being carried out with the liquid material at a height above a shoulder height of the user, said protective cuff comprising:

(a) a funnel-like outwardly open collar (1) for intercepting said liquid material, said collar including an axially inner end having an anchor portion (3) thereon and a conical portion which widens axially outwardly from said axially inner end to a distal end; and

(b) a holder portion (2) adapted to firmly yet somewhat yielding support said collar on a forearm of the user, said holder portion including a radially outer portion (4) enclosing and supporting said anchor portion (3) of said collar to thereby constitute a bottom therefor, and a radially inner elongated portion (5) adapted to be fitted directly over and enclose a forearm of the user adjacent to a wrist of the user, said radially inner elongated portion being formed of a soft material.

4,984,300

PROTECTIVE GLOVE

Soo Se Cho, Roseland, Fla., assignor to Macho Products, Inc., Palm Bay, Fla.

Filed May 5, 1989, Ser. No. 347,670

Int. Cl.[5] A41D *13/10*

U.S. Cl. 2—18 **16 Claims**

1. A protective glove adapted to fit over and cover the back of the wrist and hand, including the fingers, of a wearer to protect from injury in the art of karate and the like, comprising:

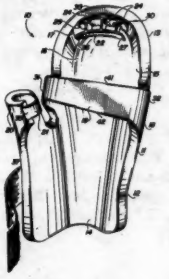
a flexible, resilient foam member having a rear portion and a front portion;

said rear portion including a wrist portion comprising encircling means adapted to partially surround the wrist and open at the inner wrist;

said front portion having an open inner surface generally contoured to match the back of the hand and fingers, and including a thickened portion adapted to cover the knuckles and proximal phalanges, and a finger portion extending downwardly from a forward part of said thickened portion and adapted to cover at least the bases of the fingers when the hand is placed in the glove in a finger extended position;

strap means connected across said front portion transversely of said inner surface and arranged to extend across an upper palm portion between the thumb band the fingers to secure and retain said front portion to the hand; and

means located at said finger portion and spaced apart from said strap means, said means comprising an elongated laterally extending gripping member having free floating ends and a plurality of stringers connecting laterally spaced points on said gripping member intermediate said ends to said inner surface with said ends left unconnected, said means being adapted to be grasped with the gripping member extending across the fronts of the fingers and said



stringers respectively extending between adjacent fingers, so as to secure and retain said finger portion against the back of the fingers and draw said front portion toward said rear portion by said stringers when the hand is placed in the glove and closed into a fist;

the unconnected free floating ends projecting laterally beyond said stringers to assist the wearer in forming the fist and said ends cooperating with said stringers to draw said stringers generally normal to said inner surface to tighten the glove when the fist is made while permitting unrestricted lateral movement of the fingers adjacent said ends when said glove is tightened; and

said glove further comprising means extending across the inner wrist opening of said rear portion for releasably securing and retaining said rear portion to said wrist.

4,984,301

SHOOTERS GLOVE

Joseph F. Jordan, Jr., 118 Merrifield Ct., Greenville, S.C. 29615

Filed May 22, 1989, Ser. No. 355,903

Int. Cl.[5] A41D *19/00*

U.S. Cl. 2—161 A **4 Claims**

1. An insulated police glove for improved manual operations such as safe operation of a firearm, said glove comprising:

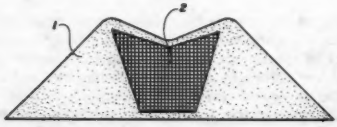
a hand covering having a main body for covering the palm and back of a user's hand, and having only five finger stalls integrally attached with said main body, which stalls are adapted for respective receipt of the five fingers of a user's give hand, including the user's thumb, forefinger, middle finger, ring finger, and small finger of a give hand; wherein

a layer of insulation is formed fully in and only in said main body and said finger stalls adapted for receipt of a user's middle, ring, and small fingers of a give hand, for added warmth and protection of the user's hand; so that said finger stalls adapted for receipt of a user's thumb and

forefinger of such given hand do not have a layer of insulation, but instead form relatively tight fits with such thumb and forefinger for improved manual grasping operations therewith; and further wherein

said covering includes an exterior leather-based shell and said insulation comprises thermal insulation, so that said glove maximizes warmth protection for the user's hand while minimizing bulkiness thereof for safe operation of a firearm without requiring repositioning of such glove for firearm operations.

4,984,302
NOSE-WORN AIR FILTER
Robert A Lincoln, 8325 Murphy Rd., Laurel, Md. 20707
Continuation-in-part of Ser. No. 28,702, Mar. 20, 1987, abandoned. This application Mar. 28, 1988, Ser. No. 174,393
Int. Cl.[5] A42B *1/18*; A62B *23/06*
U.S. Cl. 2—206 **9 Claims**



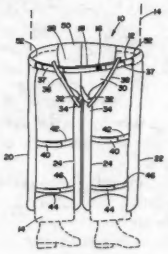
1. A nose-worn air filter for covering exterior openings of nostrils and base of a nose of a user and for attaching to sides of the nose, comprising:

a pliant nostril covering portion having a stationary air filtering element positionable over the exterior nostril openings; and

a pliant nose attachment portion joined to said nostril covering portion, said nose attachment portion having an adhesive substance on surface portions thereof and including at least two spaced apart pliant portions, said pliant nose attachment portion contacting and adhering to the two respective sides of a user's nose, from side edges of the nose base to upper portions of the nose, free of adhesive contact with other portions of the user's face, said pliant nose attachment portion having respective distal ends the pliant portions being constructed of material which when pressed against the nose adjusts and conforms to detailed curvatures and shapes of noses;

said attachment portion applying said nostril covering portion to the user's nose to form a tight seal against the base and side edges of the base and around the nostril openings and to prevent passage of air around said filtering element and into the nostrils when air is being inhaled by the user.

4,984,303
RAIN CHAPS
Stanley M. Ross, 8925-135A Street, Surrey, B.C., Canada V3V 5V2
Filed Jan. 30, 1990, Ser. No. 472,267
Int. Cl.[5] A41D *3/00*
U.S. Cl. 2—227 **13 Claims**



1. A set of rain chaps, comprising:

(a) a belt for attachment around a waist of a wearer;

(b) a pair of leg portions affixed to said belt, having a lower substantially rectangular portion with an elongated inside edge of one leg portion extending from an ankle region to ADB waist region of a wearer, overlapping a portion of another of said leg portions, and an arcuate edge joining an upper region of said inside edge to approximately midway of said belt for each of said leg portions;

(c) a pair of straps affixable to said belt at a back of said wearer and attached to corresponding ones of the upper region of each of said leg portions so that each of the upper regions of the leg portions is pulled upwardly and rearwardly so as to avoid rotation of said leg portions proximate the bottom; and

(d) strap means for attaching said leg portions around a leg of a wearer.

4,984,304
UNDERGARMENT
James G. Brown, P.O. Box 675, McGraw, N.Y. 13101
Filed Dec. 2, 1988, Ser. No. 278,955
Int. Cl.[5] A41B *9/00*
U.S. Cl. 2—401 **14 Claims**

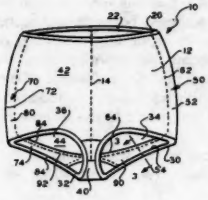
1. An undergarment comprising:

(a) means for enclosing a human body of a size and configuration to encircle at least the lower torso of a person proximate where the person's legs meet their torso and so as to be disposed proximate and to cover at least the lower buttock cheeks of the person;

(b) said body means including an upper portion for disposition about a person's lower torso and lower openings to

facilitate disposition thereof about a persons upper legs, said openings being defined by the leg bands; and

(c) means for providing an inside panel secured within said body means proximate said portion thereof to be adjacent



to said leg bands in a region which is disposed proximate to the lower buttock cheeks of a person;

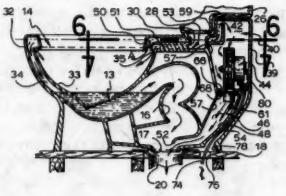
(d) said inside panel means including an insert piece being of a size, configuration, and disposition to shape and uplift the buttock cheeks of a person wearing the undergarment.

4,984,305

SELF VENTILATING TOILET

Paul J. Boisvert, 6170, Primeau Laval Québec H0A 1G0, Canada

Filed Dec. 22, 1989, Ser. No. 454,925
Int. Cl.[5] E03D *9/04, 13/00*
U.S. Cl. 4—213 **4 Claims**



1. A self ventilated toilet adapted to be mounted on a floor of a bathroom, the floor being provided with a first perforation connected to a sewage connecting line and a second perforation for allowing an electrical wire to extend through said floor, said toilet comprising:

a water tank adapted to contain water;

a bowl chamber partly located below said tank and adapted to receive water from said tank through a water intake chamber and to be flushed through a flushing aperture provided at the bottom of said bowl chamber;

a discharge passage connecting said bowl chamber to said flushing aperture, said discharge passage disposed adjacent said bowl chamber and extending to a first outlet below said bowl chamber for eliminating said flushed water through said first perforation;

a ventilating chamber mounted adjacent said discharge passage away from said bowl chamber below said tank and leading to said first outlet, said ventilating chamber having a protuberant wall portion projecting above said bowl chamber;

at least one ventilating inlet passage upwardly directed inside said toilet from said bowl chamber and extending above said water intake chamber and leading inside said protuberant wall portion to a level higher than the highest level of water in said bowl chamber, said ventilating inlet passage pneumatically linking said bowl chamber with said ventilating chamber, said protuberant wall portion having a flat upper surface for partially sitting said tank, a removable cover through said protuberant wall portion, said cover downwardly extending through a side of said ventilating chamber, the removal of said tank and said cover providing access to said ventilating chamber;

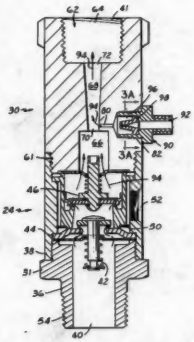
an electrical air suction device disposed across said ventilating chamber between said ventilating inlet passage and said first outlet for circulating air from said ventilating inlet passage to said first outlet, said suction device being located below said water tank.

4,984,306

CHEMICAL INJECTOR ASSEMBLY

Carl L. Sumerix, 904 N. College Rd., Mason, Mich. 48854

Filed Apr. 17, 1989, Ser. No. 339,398
Int. Cl.[5] E03D *9/02*
U.S. Cl. 4—224 **3 Claims**



1. In a self-contained toilet assembly mounted in a vehicle having a self-contained water supply, said assembly including a toilet bowl having a flush handle and interconnected to a waste water holding tank on said vehicle, and including a chemical injection system for automatically injecting a chemical to mix with flush water sent to said toilet bowl from a water inlet line connected to said vehicle water supply, said flush water being sent to said toilet bowl upon actuation of said flush handle, said chemical chemically treating said flush water as said flush water is dispensed into said toilet bowl, an improved chemical injection system comprising:

an injector housing mounted in said water inlet line, said housing having a truncated cone-shaped bore with a smaller diameter opening increasing to a larger diameter opening in the direction of flush water flow; and

a chemical input line interconnected to said injection housing in fluid communication with said longitudinal bore, said input line communicating with said bore adjacent the smaller diameter of said longitudinal bore, said input line having an input check valve therein operable to release chemical to said flush water as said flush water passes through said bore, said input check valve being a duckbill valve; and

a vacuum breaker valve assembly positioned in said water inlet line upstream of said injector housing, said vacuum breaker valve comprising a pair of spring-biased water check valves, said water check valves being spaced apart along said water inlet line such that one water check valve is further upstream than the other, an air inlet being positioned intermediate said water check valves, a seal normally blocking communication between said air inlet and said water inlet line, such that said springs normally bias said water check valves to a closed position when said flush water is not being sent to said toilet bowl, which prevents flow of said chemical upstream into said water inlet line, and then into said vehicle water supply, said air

inlet communicating air past said seal on said air inlet should an excessive vacuum be pulled on said water inlet line upstream of said upstream water check valve, thus preventing leakage of said chemical around said water check valves to contaminate said vehicle water supply.

4,984,307

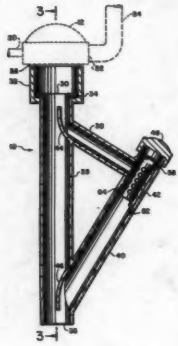
TOILET SANITIZER ATTACHMENT

Orrett Thomas, 115 Lenox Rd., Apt. E6, Brooklyn, N.Y. 11226

Continuation-in-part of Ser. No. 293,996, Mar. 29, 1989, abandoned. This application Apr. 6, 1990, Ser. No. 507,126

Int. Cl.[5] E03D *9/02*

U.S. Cl. 4—225 **12 Claims**



1. A sanitizer attachment for use with a tankless toilet bowl or urinal for sanitizing/deodorizing the flush water therefor and wherein the flush water is controlled by a flushometer, said attachment comprising:

(a) a main pipe interconnected between an outlet of the flushometer and a plumbing connection of the toilet bowl or urinal;

(b) a branch pipe having an open end and connected to said main pipe forming therewith a substantially Y-shaped configuration;

(c) a feed pipe connected to said main pipe upstream from the connection of the branch pipe with the main pipe and adjacent the connection of the main pipe to the flushometer outlet;

(d) a replaceable cartridge disposed in said branch pipe downstream from the intersection of said feed pipe with said branch pipe and containing a sanitizer/deodorizer chemical dissolvable in water;

(e) a removable sealed cap for closing and sealing the open end of said branch pipe; and

(f) a key extending lengthwise in said branch pipe and mating keyway in said cartridge so that said cartridge is fixedly positioned in said branch pipe.

4,984,308

TOILET SEALING RING

Victor H. Handal, 12 Mill Plain Rd., Danbury, Conn. 06811

Filed Jul. 17, 1989, Ser. No. 380,313

Int. Cl.[5] F16L *9/03;* **E03D** *11/00*

U.S. Cl. 4—252 R **5 Claims**

1. An improved toilet sealing ring for sealing installation encircling the upper end of a drain pipe means comprising in combination:

a. a first outer section which is ring-shaped and slightly tapered and incorporates an inwardly beveled lip;

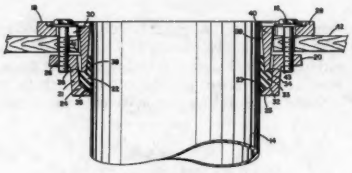
b. a second inner section which is ring-shaped having an outer surface which is slightly tapered such that at least a portion of the second section will fit overlappingly within the first section and an inner surface which is slightly tapered toward the outer surface, exposing an annular end surface thereof facing said inwardly beveled lip;

c. clamping means operatively connected to cause increased overlapping juxtaposition of said sections;

d. annular gasket means formed from resilient rubber-like material interposed between said sections and said drain pipe means incorporating a beveled outer surface positioned for being mated with the first section's beveled lip about the internal circumference of the first section;

e. means forming an annular shoulder encircling the gasket means and juxtaposed to the second section's annular end surface;

f. annular inner upper wall means on the gasket means extending axially from the shoulder and having an outer



diameter such that it fits telescopically within said second section and an outer surface which is slightly tapered to cooperate with the inner surface of the second inner section, and an inner diameter such that it encircles the drain pipe means in close juxtaposition; and

g. said gasket means having a central portion, with substantially parallel inner and outer walls, having an inner diameter and an outer diameter respectively such that increased axial overlap of said sections produced by said clamping means compresses said resilient gasket means between said beveled lip and said annular end section, urging said outer wall surface into compressive engagement with said first section means, and urging said inner wall surface into compressive engagement with said pipe means.

4,984,309

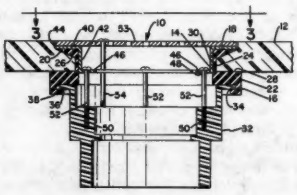
DRAIN SYSTEM

Robert D. Lowry, 330 Marguerite Ave., Cuyahoga Falls, Ohio 44221

Filed May 19, 1989, Ser. No. 354,400

Int. Cl.[5] E03C *1/12*

U.S. Cl. 4—288 **15 Claims**



1. A drain system for conveying water through a circular opening in a bottom plate member of a water retaining container to a drain member located under said bottom plate member comprising a sealing ring member of resilient material mounted on one end of said drain member, said sealing ring member having an upper flange with an outer diameter greater than the diameter of said opening for overlapping an upper surface of said plate member, a clamp ring member extending

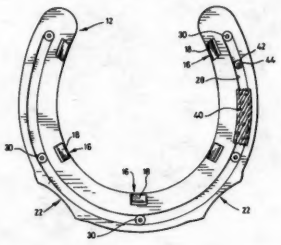
in a circle around said opening in said bottom plate member and having an outer diameter greater than an inner diameter of said sealing ring member for positioning over said sealing ring member, connecting means extending between said clamp ring member and said drain member for clamping said upper flange between said clamp ring member and said plate member to provide a permanent seal and a screen member removeably mounted on said clamp ring member over said opening, said sealing ring member being flexible for collapsing said flange to an outer diameter less than the diameter of said opening for inserting said upper flange through said opening from a space under said bottom plate to partially install said drain system, said sealing ring member being resilient to expand said upper flange and support said drain member after insertion of said flange through said opening so that said clamp ring member can be positioned over said flange and said connecting means installed between said clamp ring member and said drain member from a space over said bottom plate member and operated to pull said clamp ring member to compress said upper flange and provide a permanent seal to complete the installation of said drain system.

4,984,310

LAVATORY PAN SEAT

Enzo Casale, Lodge Farm House, Elmers Lane, Saxlingham Thorpe, Norwich, Norfolk, England

Filed Jul. 17, 1989, Ser. No. 381,099
Int. Cl.[5] E03D *9/052*
U.S. Cl. 4—347 **5 Claims**



1. A lavatory pan seat having a shape substantially conforming to the shape of a rim of a conventional lavatory pan and having hinge mounting means whereby said pan seat is hingeable to said pan at a back of the rim, wherein the improved lavatory pan seat, comprises:

a plurality of air inlet apertures in a wall of said pan seat adjacent the inside periphery of said pan seat, and an opening for air extraction in said pan seat wall adjacent the outside periphery of said pan seat;

passage means communicating with said inlet openings and said air extraction opening, said passage means comprising an air flow channel within the interior of said pan seat extending around at least part of a curved length of said pan seat;

substantially similarly curved upper and lower parts which define said air flow channel between them, the lower part having a substantially horseshoe shape, with an incomplete perimeter at the front; and,

means fixing said upper and said lower parts together, wherein said lower part of said pan seat includes:

a resilient strip around at least a major part of its curved length and for sealing against the pan rim; and,

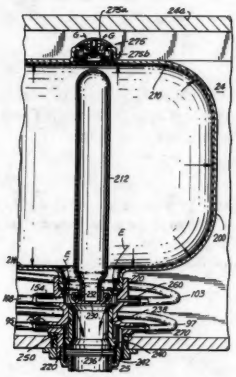
a microswitch and an opening to a hole with said microswitch being accommodated in the hole and being arranged for operation by compression of said resilient strip, which covers both the opening to the microswitch hole and said fixing means securing said upper and lower parts together, said microswitch being provided to control the operation of power means for extracting air through the air extraction opening.

4,984,311

FLUSHING MECHANISM WITH LOW WATER CONSUMPTION

Peter A. Basile, Lawrenceville; Ashvani K. Madan, Ocean; Fred E. Snyder, Princeton Junction, all of N.J., and Harold M. Stillman, Scarsdale, N.Y., assignors to American Standard Inc., New York, N.Y.

Filed Nov. 30, 1989, Ser. No. 440,363
Int. Cl.[5] E03D *3/10*
U.S. Cl. 4—354 **23 Claims**



1. A flushing mechanism for flushing a bowl with liquid comprising a containment vessel, elastic bladder means supported in said containment vessel for holding a predetermined amount of said liquid, inlet means for introducing said liquid under pressure into said elastic bladder means to expand said elastic bladder means, outlet means on said containment vessel coupleable to said bowl and open to said elastic bladder means for releasing said liquid in said elastic bladder means into said bowl, sealing means for releaseably sealing said outlet means, and actuation means for selectively actuating said sealing means to open said outlet means to release liquid in said elastic bladder means into said bowl under the force exerted by said elastic bladder means, said containment vessel including bladder support means supported therein for supporting said elastic bladder means when deflated.

4,984,312

FLUSH VALVE ADJUSTABLE ADAPTER

Daniel A. Pickerrell, Fishers, and John Inch, Indianapolis, both of Ind., assignors to Masco Corporation, Ind.

Filed Apr. 26, 1989, Ser. No. 343,451
Int. Cl.[5] E03D *1/00/1/34*
U.S. Cl. 4—378 **10 Claims**

1. An adapter for a flush valve in a toilet tank, said adapter characterized by:

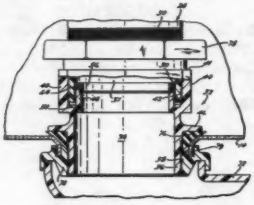
a tubular body member having a first threaded lower end and second threaded upper end;

said lower end being exteriorly threaded and sized to threadably engage a threaded annular connection section positioned under said toilet tank;

a radially outwardly extending shoulder between said upper and lower ends for seating a sealing gasket between said shoulder and said toilet tank;

said upper end being threaded along a cylindrical wall to threadably engage a threaded section of a tubular bottom end of a flush valve;

sealing means for sealing said connection between said adapter and said tubular bottom end of said flush valve, including a tubular wall coaxially positioned with, and facing, said wall of said upper end, said wall of said upper



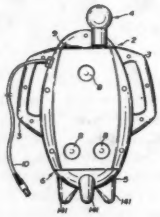
end and said tubular wall defining generally parallel spaced cylindrical surfaces, said tubular wall including a groove, facing said cylindrical wall of said upper end said groove receiving a sealing ring.

4,984,313

HEAD-HELD BUBBLE BATH APPARATUS

Zenzaburo Hara, Tokyo, Japan, assignor to Hara Health Industrial Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1989, Ser. No. 394,559
Int. Cl.[5] A61H *33/02*
U.S. Cl. 4—542 **4 Claims**



1. A hand held bubble bath apparatus for generating a pressurized stream of water mixed with bubbles to be used while bathing, which comprises:

(a) a housing;

(b) water intake means at one end of said housing leading to a motor driven water pump disposed within said housing;

(c) leg means disposed in close proximity to said water intake means, so that said water intake means is prevented from coming into direct contact with an external surface and by which means the apparatus may be stood on end on a horizontal surface, said standing on end being stabilized by a negative pressure generated in proximity to said water intake means by virtue of said water pump within said housing;

(d) air intake means located at an end of said housing opposite to said water intake means, said air intake means leading to mixing means located within said housing wherein pressurized water from said water pump is mixed with air from said air intake means to form a stream of pressurized water admixed with bubbles said air intake means having an external tubular extension of variable length whereby the apparatus may be submerged and the most distal aspect of the air intake means may be above water level;

(e) output means positioned on said housing intermediate said water intake means and said air intake means;

(f) filtration means for preventing foreign objects from entering said water pump;

(g) a plurality of suction cups provided on a surface of said housing, wherein said surface forms approximately a 90° angle with said end of said housing wherein said water intake is located, so that said bubble bath apparatus can be detachably attached to a wall of a bathtub said plurality of suction cups including at least one suction cup having a ball-and-socket mounting means on said housing whereby the suction cup may be pivoted, thereby allowing the apparatus to be attached to a non-planer surface; and

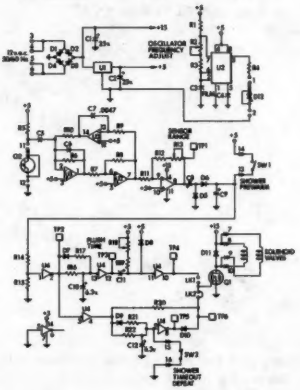
(h) at least one handle mounted on the housing for manipulation of the apparatus during hand held use.

4,984,314

AUTOMATIC FLUID-FLOW CONTROL SYSTEM

Hans Weigert, Ridgewood, N.J., assignor to Water-Matic Corporation, New City, N.Y.

Continuation-in-part of Ser. No. 185,377, Apr. 22, 1988, Pat. No. 4,823,414, which is a continuation of Ser. No. 821,406, Jan. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 714,366, Mar. 21, 1985, abandoned. This application Apr. 21, 1989, Ser. No. 341,727
Int. Cl.[5] A47K *4/00*
U.S. Cl. 4—663 **4 Claims**



1. A system for controlling liquid flow in bathrooms in response to the presence of the user, which system is configuration adjustable by the installer of same to permit a plurality of preselected sanitary applications; said system comprising:

(a) light emitting means positioned for emitting a light beam of predetermined spectrum and frequency for illuminating a zone interceptable by said user;

(b) light sensor means juxtaposed to said light emitting means for detecting reflected light beams originating from said light emitting means and reflected back from said user; said light sensor means providing a low level output signal in response to said reflected light beams;

(c) high-Q filter means tuned to the frequency of said light beams, receptive of said low-level output signal from said light sensor means, for filtering out unwanted signals and "noise" from said output signals;

(d) variable gain amplifier means for both amplifying the filtered signal from said high-Q filter means and setting the sensitivity of said system;

(e) detector means receptive of an output signal from said amplifier means for rectifying or demodulating the same, to provide a DC output signal;

(f) first circuit means responsive to said DC output signal, for actuating fluid flow for a maximum preselected period,

thereby to enable use of said system in controlling faucet flow in a sink or other receptacle in response to the presence of the user's hands;

(g) second circuit means responsive to said DC output signal; said second circuit means including arming means for arming the second circuit means following the existence of said DC output signal to said second circuit means for a first predetermined period; and said second circuit means including means for thereupon generating a flow control signal for a second predetermined period following extinction of said DC output signal; thereby enabling use of said system to control flushing of urinals and commodes;

(h) third circuit means responsive to said DC output signal for providing a flow control signal during the existence of said DC output signal, thereby enabling said system to be used for control of shower flow during the presence of said user in said shower; and

(i) configuration selection means, selectively adjustable at installation of said system, for configuring said system to select an output signal from only one of said first, second and third circuit means in accordance with the requirements of installation.

4,984,315

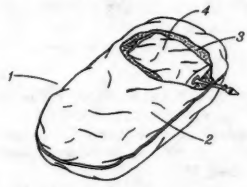
PREGNANCY PILLOW WITH INFLATIBLE BLADDER

Chet B. Ortman, and Jennifer L. Ortman, both of 712 11th Ave. N.E., Wenatchee, Wash. 98802

Filed Jun. 1, 1990, Ser. No. 531,638

Int. Cl.[5] A47C *27/08*; A47G *9/00*

U.S. Cl. 5—431 **3 Claims**



1. A pillow for use during a woman's pregnancy comprising:

an oblong exterior shell, having two generally parallel longer sides, two generally parallel shorter sides, and generally parallel top and bottom sides, said shell forming an enclosed structure;

an interior core, said core formed of a polyfill material that is distributed evenly throughout said enclosed structure of said shell;

a sole elongated bladder, said bladder positioned adjacent one end of said pillow, proximate one of the shorter sides of said shell, and extending between and proximate to said longer sides, said bladder being contained within said interior core, said bladder forming an inner compartment within said pillow, said bladder being surrounded by said polyfill material;

means for injecting air into said bladder such that a smooth and round projection is formed at one end of said pillow by said inner compartment;

means for releasing air from said bladder;

said pillow being adjustable in a continuous range of shapes between two extreme shapes, a first extreme shape being substantially L-shaped in elevation, wherein said bladder is fully inflated with air and said projection is largest, and a second extreme shape, substantially oblong in elevation, wherein said bladder is deflated and said pillow has flat top and bottom sides;

wherein, said pillow may be adjusted to a particular woman's shape and form by injecting air into or releasing air from said bladder.

4,984,316

BED WARMER

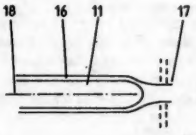
Stuart M. Simpson, 86 Beechfield, Leeds, Great Britain LS12 50S ; Peter Garth, 3 Highwood Avenue, Moortown, Leeds, Great Britain LS17 6EQ , and Jonathan Richards, Polars, High Easter, Chelmsford, Essex, Great Britain CM1 4RB

Filed Dec. 19, 1989, Ser. No. 452,428

Claims priority, application United Kingdom, Feb. 9, 1989, 8902879

Int. Cl.[5] A47C *21/04*

U.S. Cl. 5—508 **7 Claims**



1. A bed warmer comprising:

an envelope formed from a flexible, substantially non-porous material so as to define an air receiving and holding container, said envelope including a top wall and a bottom wall, said walls having a tendency to adhere to each other, and having a substantially flat shape;

inlet means defined in a wall of said envelope for receiving heated air from a source of hot air to inflate said envelope;

a plurality of apertures defined through at least one wall of said envelope so as to allow controlled passage of air from the interior of the envelope upon inflation; and

means for minimizing adherence between said top wall and said bottom wall including a divider sheet disposed within said envelope and extending between and in a plane substantially parallel to said top wall and to said bottom wall of said envelope.

4,984,317

METHOD OR APPARATUS FOR TREATING TEXTILE FABRIC OR GOODS

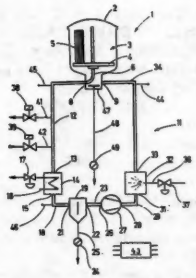
Wilhelm Christ, Michelbach an der Bilz, Fed. Rep. of Germany, assignor to Then Maschinen- und Apparatebau GmbH, Schwäbisch Hall-Hessental, Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 358,680

Claims priority, application Fed. Rep. of Germany, May 31, 1988, 3818414

Int. Cl.[5] D06B *5/18*

U.S. Cl. 8—149.1 **34 Claims**



1. A method of treating textile goods or fabric with a treatment substance in which

the textile goods are wound packages (5) retained on a holder structure (4);

placing the holder structure (4) with the wound package (5) of textile goods thereon into a vessel (2) defining a treatment chamber;

applying a stream of gas to the wound package (5) of textile goods in the chamber;

adding the treatment substance to the gas stream in finely dispersed or divided form to cause the gas stream to carry and transport said finely dispersed treatment substances,

wherein the step of applying the gas stream to the textile goods comprises forcing the gas stream through the wound textile goods and distributing said treatment substances solely by action of the gas stream toward, over, and into the textile goods;

removing the stream of gas after having passed through the wound package of textile goods from the vessel; and

removing excess treatment substances by said gas stream.

27. In combination with textile goods,

an apparatus for treating said textile goods, carrying out the method of claim 1, comprising

a vessel (3) defining a treatment chamber having said textile goods located therein;

a holder structure arranged for holding said textile goods thereon in wound package form whereby said textile goods will form wound packages (5) of textile goods on the holder structure, said holder structure with the wound textile goods packages thereon being located within the treatment chamber;

a gas generating and circulating loop system (3, 4, 5, 8, 9, 12, 18, 27, 29, 34) including

inlet gas duct means (9) located in said vessel and communicating with said treatment chamber;

outlet gas duct means (8) for removal of gas from said treatment chamber;

a circulating gas pump (27) located outside of said vessel for supplying a stream of gas under pressure through said inlet means into said vessel and through said packages of textile goods;

means (32) for adding a treatment substance, in finely divided or dispersed form, located outside of said vessel, said treatment substance adding means adding treatment substances to the gas stream supplied into said vessel,

said gas stream passing through said vessel and through said goods on said holder structure and hence distributing said treatment substances solely by action of the gas stream toward, over, and into the textile goods in said chamber,

said gas stream being supplied by said gas pump for additionally removing excess treatment substances from the goods.

4,984,318

METHOD AND SYSTEM FOR THE RECOVERING OF SOLVENTS IN DRY CLEANING MACHINES

Damaso Coindreau-Palau, Bosques de Chapultepec 104, Col. Bosques Del Valle Monterrey, Nuevo Leon, Mexico

Filed Jun. 28, 1989, Ser. No. 373,023

Int. Cl.[5] D06B 9/06

U.S. Cl. 8—158 **10 Claims**

8. In a conventional method for washing and drying of articles in a dry cleaning machines by means of solvents that comprises the steps of:

(a) Providing a cleaning chamber adapted to receive a certain amount of articles to be washed;

(b) introducing the articles to be washed within the cleaning chamber;

(c) filling the chamber with chemical solvents;

(d) washing the articles with said chemical solvents to remove dirt from said articles;

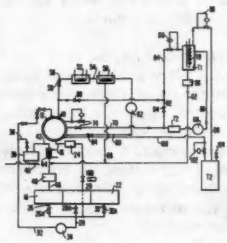
(e) draining the articles and during draining step, distilling the solvent in order to remove solid dirt particles from said solvent leaving the solvent clean for a new washing cycle;

(f) drying the articles with hot air; and,

(g) completing the cycle of operation of the dry cleaning machine;

a method for the additional recovery of chemical solvents for use in said dry cleaning machine comprising the steps of:

(h) extracting air and solvent contained in the cleaning chamber after the completion cycle of washing and drying said articles has been carried out;



(i) compressing and then cooling and recovered air and solvent in a condensing stage, at high pressure, in order to recover additional solvent that has been extracted from said cleaning chamber;

(j) storing the recovered solvent for use in a new washing cycle; and,

(k) extracting said cleaned articles from said cleaning chamber after the cleaning, drying and additional solvent cycles have been completed.

4,984,319

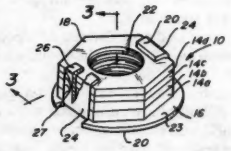
METHOD OF MANUFACTURING A LAMINATED NUT HAVING CAGE WITH NESTED FINGERS

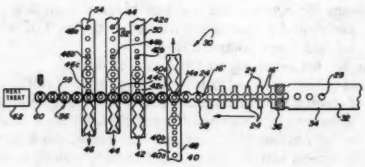
Richard L. Reynolds, Grosse Pointe Shores, Mich., assignor to Pac-Fasteners, (an affiliate of Peterson American Corporation), Southfield, Mich.

Division of Ser. No. 388,658, Aug. 2, 1989, Pat. No. 4,940,377. This application Mar. 16, 1990, Ser. No. 494,472

Int. Cl.[5] B21D 53/24

U.S. Cl. 10—86 A **19 Claims**





1. In a laminated nut comprising a plurality of conical spring discs, a cage for receiving and holding said spring discs in a stacked, aligned relationship to define a central opening

threaded to be matably received upon an associated threaded bolt, said cage including a bottom plate portion and a plurality of axially extending fingers cooperating with said plate portion to hold said spring discs in a stacked, aligned relationship, said spring discs having a plurality of circumferentially disposed flats, the method of manufacture comprising the steps of: providing a continuous strip of flat stock, forming a plurality of blanks connected together by a bridge of material, forming each blank to have said bottom plate portion with said fingers in a generally common plane, folding said fingers to extend axially from said bottom plate portion, forming said spring discs with axially extending slots in said flats, locating said spring discs onto said bottom plate portion with said fingers in said slots, folding the upper end of said fingers radially inwardly generally against the adjacent one of said disc springs to form retaining tabs holding said spring discs to said cage, and severing said bridge to remove the formed laminated nut.

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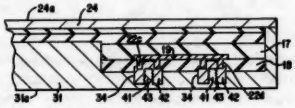
SHOE SOLE EMBOSSED COMPOSITION AND METHOD

John J. Curley, Jr., Dunstable, Mass.; Jui-Chiung Yang, and Tzu-Hung Yeh, both of Taichung, China, assignors to Foot-Joy, Inc., Brockton, Mass.

Filed Apr. 17, 1989, Ser. No. 338,915
Int. Cl.[5] A43B 5/00; A43C 15/16
U.S. Cl. 12—146 BR **11 Claims**



1. A shoe sole construction formed and treated using a method comprising

a. laminating together

i. a shaped upper sole portion of ethylene-vinyl acetate and butadiene rubber;

ii. a shaped lower sole portion of ethylene-vinyl acetate and butadiene rubber having at least one aperture therein;

iii. a low-melting point plastic insert positioned intermediate of the sole portions including a planar member and a socket element extending generally perpendicular from the planar member and located to extend into said lower portion aperture; the upper and lower sole portions being laminated together using pressure and an adhesive to form a laminate having an exterior skin portion;

b. selecting a mold having exterior sides and an interior cavity for heating and cooling therein by heating the exterior sides and thereafter cooling the exterior sides;

c. placing in the mold cavity a plug of insulating material to retard heat transfer from the mold exterior side to said plastic insert; and

d. introducing the laminate into the mold with the insulating plug positioned between the mold exterior and the plastic insert

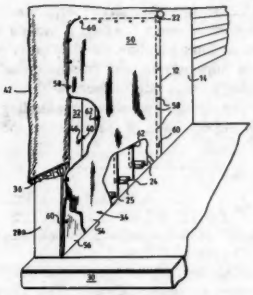
whereby the mold heating with insulation plug so positioned is controlled to prevent raising the temperature of the plastic insert above a point where such insert becomes damaged while permitting embossing of the exterior skin portion of the laminate.

4,984,321

WEATHERPROOF AND FIREPROOF LOADING BRIDGE CANOPY

James Larson, East Hills, N.Y., assignor to BridgeTech Inc., Brentwood, N.Y.

Filed Oct. 18, 1989, Ser. No. 423,810
Int. Cl.[5] B65G 11/10, 11/14, 69/22
U.S. Cl. 14—71.5 **18 Claims**



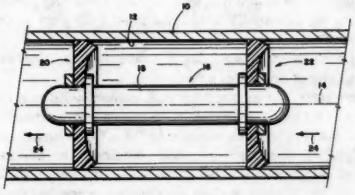
1. A loading bridge comprising an expandable frame comprising a floor and a plurality of inverted U-shaped ribs articulatingly mounted on said floor defining a tunnel-like passageway, a canopy for enclosing said frame comprising an exterior cover draped over said ribs on the exterior thereof and an inner wall structure comprising at least a pair of opposed fireproof panels hung from said ribs on the interior thereof.

4,984,322

ELASTOMERIC DISC FOR USE ON A PIPELINE PIG

Hyun J. Cho, Tulsa, and William J. Rankin, Sapulpa, both of Okla., assignors to TDW Delaware, Inc.

Filed Nov. 7, 1989, Ser. No. 433,535
Int. Cl.[5] B08B 9/04
U.S. Cl. 15—104.061 **1 Claim**



1. An elastomeric disc for use on a pipeline pig of the type having a longitudinal body supported centrally within a pipeline for movement by fluid flow therethrough, the disc comprising:

a unitary elastomeric member having an inner portion of selected thickness and having a center;

an outer peripheral surface normally concentric with said center;

means for attachment of said inner portion to a pipeline pig body whereby the disc is supportable in a plane perpendicular the pipeline axis;

an integrally formed circumferential outer portion integrally extending from said inner portion to said outer peripheral surface and having said peripheral surface thereon, the outer portion having opposed side surfaces, the outer portion being of increased thickness in relation to the spacing thereof from the disc center, the outer peripheral

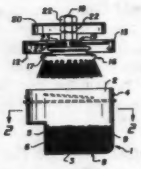
surface being defined by first and second intersecting frustraconical surfaces such that one of said frustraconical surfaces is parallel to the inner wall of a pipeline through which the disc is moved in a first direction and the other of said frustraconical surfaces is parallel to the inner wall of a pipeline when the disc is moved in a second direction, the first frustraconical surface being substantially perpendicular to said first side surface when the disc is moved in one direction within a pipeline and the second frustraconical surface being substantially perpendicular to said second side surface when the disc is moved in the opposite direction within a pipeline, the disc outer portion thereby providing support to said frustraconical surfaces, the intersection of said side surfaces with said frustraconical surfaces providing opposed wiping leading edges depending upon the direction of the travel of the disc in a pipeline.

4,984,323

DENTURE BRUSH DEVICE

Kevin C. Digby, 6863 Sherbrooke Street, Vancouver, British Columbia, Canada V5X 4C9

Filed Dec. 29, 1989, Ser. No. 452,758
Claims priority, application Canada, Jan. 18, 1989, 588555
Int. Cl.[5] A46B *13/00*
U.S. Cl. 15—104.920 **6 Claims**



1. A denture brushing device comprising:

a container having an open top, a base, upper portion with an essentially cylindrical cross-section, and a denture receiving portion of reduced cross-sectional area adjacent the base of the container, said denture receiving portion defining an essentially U-shaped cavity adapted to hold dentures;

support means in said denture receiving portion to support dentures placed in said device;

a container lid adapted for engagement with said container, said lid having a manually rotatable brush extending therethrough such that when said lid is fitted on said container said brush extends into said container whereupon rotation of said brush acts to clean said dentures, said U-shaped cavity of said denture receiving portion preventing said dentures from rotating with said brush.

4,984,324

PUSH-PULL PAINT SCRAPER TOOL

Ben J. Farris, 304 Burleson, Smithville, Tex. 78957

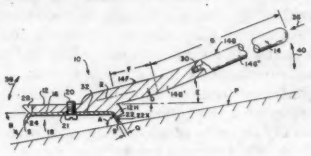
Continuation-in-part of Ser. No. 386,111, Jul. 28, 1989, abandoned, and Ser. No. 208,584, Jun. 20, 1988, abandoned. This application Feb. 23, 1990, Ser. No. 483,825
Int. Cl.[5] A47L *13/08*
U.S. Cl. 15—236.05 **5 Claims**

1. A hand held scraper tool comprising, in combination:

a support head having a scraper plate coupling surface and a heel projecting transversely to said coupling surface;

an elongated handle attached to said support head, said elongated handle being angularly inclined at a fixed, acute angle with respect to said coupling surface;

a scraper plate having a central portion removably attached to said support head coupling surface, said scraper plate having a scraper blade disposed for push scraping engagement against a workpiece; and,



said heel being disposed in bracing engagement against said scraper blade for reacting against push forces imposed upon said scraper blade.

4,984,325

WINDSHIELD WIPER

Masaru Arai, and Itsuro Saita, both of Yono, Japan, assignors to Nippon Wiperblade Co., Ltd., Yono, Japan

Filed Nov. 7, 1989, Ser. No. 432,877
Claims priority, application Japan, Nov. 15, 1988, 63-148104[U]; Feb. 3, 1989, 1-11415[U]; Feb 9, 1989, 1-13615[U]
Int. Cl.[5] A47L *1/00*
U.S. Cl. 15—250.2 **11 Claims**

1. A windshield wiper mechanism including an arm head adapted to be rotatably connected to a stationary part of a vehicle, a main arm having one end rotatively supported on the arm head for rotation around a first axis of rotation and adapted to have a wiper blade mounted on the other end thereof, a sub-arm having a wing supported thereon and being rotatively supported on said arm head for rotation around a second axis of rotation, said wing having a surface defining a plane, said sub-arm overlying and abutting said main arm so that the second axis of rotation defines with respect to the first axis of rotation an acute angle positioned such that with respect to the plane of the wing part of the force of air acting on the wing as a vehicle on which said wiper mechanism is mounted moves through air is transmitted to the main arm.

4,984,326

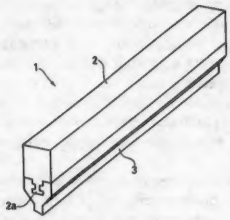
BLADE FOR ELECTROPHOTOGRAPHIC APPARATUS

Shinji Horie; Hideto Shimizu; Michio Ohmori, and Hiroshi Yui, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd. and Ricoh Company Ltd., both of Tokyo, Japan

PCT No. PCT/JP88/00946, § 371 Date May 24, 1989, § 102(e) Date May 24, 1989, PCT Pub. No. WO89/05000, PCT Pub. Date Jun. 1, 1989
PCT Filed Sep. 16, 1988, Ser. No. 360,890
Claims priority, application Japan, Nov. 27, 1987, 62-299034
Int. Cl.[5] G03G *21/00*
U.S. Cl. 15—256.5 **11 Claims**

1. A blade of an electrophotographic apparatus using a toner, which is characterized in that the blade comprises a fluorocarbon polymer composition comprising 60 to 95% by weight of a fluorocarbon polymer, 40 to 5% by weight of a positively chargeable and non-conductive inorganic filler hav-

ing an average particle diameter of 5 μm or less, and 0 to 25 parts by weight, per 100 parts by weight of the total of said



fluorocarbon polymer and inorganic filler, of a conductive filler having an average particle diameter of 5 μm or less.

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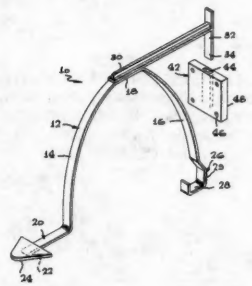
SHOE HOLDER

George J. Braverman, 12950 Oxnard St., Van Nuys, Calif. 91401

Filed Aug. 24, 1989, Ser. No. 397,901
Int. Cl.[5] A47L *23/18*
U.S. Cl. 15—267 5 Claims



3. A shoe holder particularly adapted for use in dyeing, cleaning or polishing shoes without touching the shoe, which comprises

a generally U-shaped flexible handle having a forward arcuate portion and a rear arcuate portion,

a forwardly extending toe portion connected to the lower end of said forward arcuate portion, for insertion into the toe of a shoe, said forwardly extending toe portion terminating in a bent and rearwardly extending portion,

a tongue connected to the lower end of said forwardly extending toe portion adjacent to said bent portion,

a rearwardly extending heel portion connected to the lower end of said rear arcuate portion, for insertion into the heel of a shoe, said rearwardly extending portion being grooved along the rear outer surface thereof for frictional engagement with the insole surface of the back of the shoe, and

an angled forwardly extending portion connected to the lower end of said rearwardly extending heel portion,

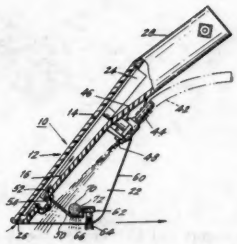
whereby when said handle is flexed and said forwardly extending toe portion and said rearwardly extending heel portion are inserted in proper position in a shoe, the shoe is fixedly positioned on the holder, with the tongue and bent rearwardly extending portion making contact with the inside of the shoe and the angled forwardly extending portion providing rigidity.

4,984,328

DRIP CLEANER ATTACHMENT WITH SOLID CLEANING CONCENTRATE

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Mar. 27, 1990, Ser. No. 499,800
Int. Cl.[5] A47L *7/00*
U.S. Cl. 15—322 13 Claims



1. A drip cleaner attachment for connection to a suction cleaning apparatus, or the like, the attachment comprising:

a housing having a suction inlet, a suction outlet for connection to a suction cleaner, a suction passage through the housing between the suction inlet and the suction outlet, whereby material may be suctioned from a surface through the suction inlet to the suction cleaner;

liquid dispensing means supported at the housing and comprising means for receiving liquid from a liquid supply and for dripping the liquid toward an area on the surface that is near the surface area to be suctioned by the suction inlet;

liquid distribution means supported at the housing in the drip pathway of the liquid from the dispensing means, the distribution means being adapted for permitting the dripped liquid to pass therethrough to the surface to be cleaned, the distribution means including means which receives and transmits some of the liquid dripped on the distribution means away from the location where the liquid is dripped on the distribution means;

a non-liquid supply of cleaning concentrate supported at the liquid distribution means at a location such that the distribution means transmits some of the liquid which contacts the distribution means to the non-liquid cleaning concentrate supply for wetting the non-liquid cleaning concentrate supply with the liquid and for dissolving some of the concentrate, the concentrate supply being supported above the surface such that the dissolved concentrate will drip to the surface.

4,984,329

DUCT SWEEPER

Calvin N. Wade, Hico, Tex., assignor to Steamatic, Inc., Grand Prairie, Tex.

Filed Sep. 14, 1989, Ser. No. 407,348
Int. Cl.[5] A47L *9/02*
U.S. Cl. 15—387 5 Claims

1. A cleaning apparatus, comprising:

a housing means having first and second spaced apart ends,

a first flexible hose means having first and second ends with said second end being coupled to said first end of said housing means,

a second flexible hose means having first and second ends with its said first end being coupled to said second end of said housing means,

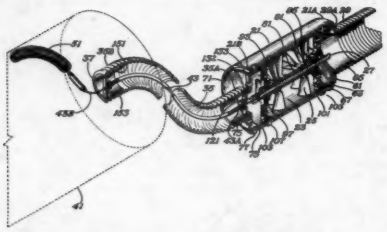
said second flexible hose means being insertable into a duct for cleaning purposes.

said second flexible hose means, said housing means, and said first flexible hose means providing a flow path for the flow

of air between said second end of said second flexible hose means and said first end of said first flexible hose means,

turbine means supported within said housing means for rotation about an axis upon the passage of air through said housing means by way of said flow path,

a flexible drive shaft extending through said second flexible



air hose means and having a first end coupled to said turbine means and a second end extending out of said second end of said second flexible hose means for rotation with said turbine means, and,

brush means coupled to said second end of said flexible drive shaft for rotation therewith for cleaning the wall of said air duct upon rotation of said flexible drive shaft.

4,984,330

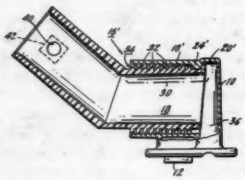
NOZZLE ASSEMBLY FOR A VACUUM DEVICE

Robert C. Berfield, Jersey Shore, and Ronald F. Meland, Muncy, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Continuation of Ser. No. 171,145, Mar. 16, 1988, abandoned, which is a continuation of Ser. No. 938,850, Dec. 8, 1986, abandoned. This application Jul. 27, 1989, Ser. No. 385,966

Int. Cl.[5] A47L *9/02*

U.S. Cl. 15—415.1 R **3 Claims**



1. A nozzle assembly for a vacuum device, said nozzle assembly comprising:

(A) a nozzle having an inlet opening, said inlet opening including:

(1) a slightly tapered, generally cylindrical internal wall;

(2) a longitudinal axis through said slightly tapered, generally cylindrical internal wall; and

(3) an inwardly projecting retaining ring, said retaining ring including a lower gap; and

(B) a suction conduit, said suction conduit including:

(1) a generally cylindrical external wall, said generally cylindrical external wall including an end;

(2) a longitudinal axis through said generally cylindrical external wall; and

(3) a coupling section for insertion into said inlet opening, said coupling section including:

(a) an outer surface with grooves extending thereabout, said outer surface being slightly tapered and generally cylindrical so as to be cooperable with said slightly tapered, generally cylindrical internal wall of said inlet opening to maintain a reasonably tight fit between said inlet opening and said suction conduit while permitting rotational movement of said suction conduit relative to said inlet opening; and

(b) an outwardly projecting retaining segment, said retaining segment being located at said end of said generally cylindrical external wall, said retaining segment being adapted to fit through said lower gap of said retaining ring during said insertion into said inlet opening; and

wherein said retaining ring is arranged with respect to said generally cylindrical internal wall to obtain said reasonably tight fit between said inlet opening and said suction conduit;

wherein said retaining ring and said retaining segment are adapted to prevent removal of said suction conduit from said inlet opening during normal usage of said nozzle assembly but to permit ready removal of said suction conduit from said inlet opening when desired; and

wherein said grooves and said generally cylindrical internal wall of said inlet opening are adapted to define an interface region for:

(a) receiving and harmlessly containing debris that would otherwise tend to jam said suction conduit in fixed relation with respect to said inlet opening; and

(b) providing a seal between said coupling section and said inlet opening.

4,984,331

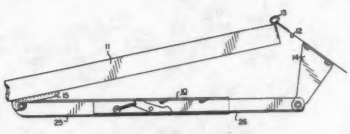
DOOR HOLDER INCLUDING A REMOVABLE CAM

Richard Hucknall, 3 Fairview Ave., Great Neck, N.Y. 11023

Continuation-in-part of Ser. No. 810,222, Dec. 18, 1985, Pat. No. 4,754,522. This application Jul. 5, 1988, Ser. No. 214,407

Int. Cl.[5] E05F *3/04*

U.S. Cl. 16—51 **8 Claims**



1. A door holder for selectively positioning a door, comprising means for biasing said door to a closed condition, first and second telescopingly engaged housings, said first housing having at least one stop surface at a particular location to establish a particular door position, said second housing having a cam follower pivotally connected to engage said stop surface, said first and second housings being pivotally connected between said door and a fixed surface, said stop surface and said cam follower having cooperating camming surfaces that are maintained disengaged at all times except when said door is released during opening while said cam follower is at the location of said stop surface; actuating means for maintaining said cam follower in either of two stable conditions, the first of said conditions yielding unrestricted passage of said cam follower past said location, and the second yielding contact between said cam follower and said stop surface;

said actuating means comprising a separately mounted and removable cam element rigidly mounted with said first housing and in the path of said cam follower during telescopic translation of said second housing within said first housing, said cam element having a projection extending through a wall of said first housing and a groove within said projection to engage said wall and including a reset surface to reset said cam follower to said first condition.

4,984,332

SLIDE SHOE

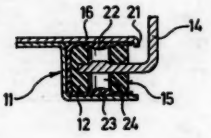
Horst Bienert, Gauting, and Max Bauer, Schondorf, both of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Gauting, Fed. Rep. of Germany

Filed May 21, 1990, Ser. No. 525,732

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1989, 3920372

Int. Cl.[5] E05D *13/02*

U.S. Cl. 16—93 R 19 Claims



1. Slide shoe for slidably carrying a roof cover panel in a sliding motion, the slide shoe having a slide shoe body made of rubber with means for mounting the slide shoe onto a slide shoe carrier, and a preferred slide casing made of synthetic plastic material which is mounted by being slid over the rubber slide shoe body.

4,984,333

SEPARABLE HINGE CONNECTION

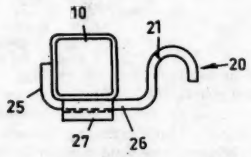
Ladislav S. Karpisek, 86 Woodfield Boulevarde, Caringbah, New South Wales, 2229, Australia

Filed Dec. 12, 1989, Ser. No. 449,569

Claims priority, application Australia, Dec. 12, 1988, PJ1918

Int. Cl.[5] E05D *7/10*

U.S. Cl. 16—266 5 Claims



1. A separable hinge connection comprising a leaf member and pin means, the leaf member having a first hooked end and a second hooked end, a bridge overlying with clearance a body part of the leaf member intermediate the ends of the leaf member, the first hooked end and the bridge permanently coupling the leaf member to a door having the leaf body part being disposed between the bridge and the door for permitting limited free movement to a pre-determined extent of the leaf member in all directions relative to the door, the second hooked end being for releasable engagement with a hinge pin of the pin means, a lug on the second hooked end of the leaf member and a cooperating first stop on the pin means limiting the maximum arc of door opening movement, a second stop on the pin means overlying an upper edge of the second hooked end of the leaf member except for a last portion of the maximum door opening movement when said second hooked end passes beyond the second stop means, first means and second means, respectively, for preventing and restraining removal of the second hooked end from the hinge pin in a first direction and a second direction, respectively, said second means having a height above which said leaf member is raisable in the first direction when the door is in said last portion of the door opening movement thereby allowing the leaf member to pass over said second means in said direction to uncouple the leaf member from the hinge pin.

4,984,334

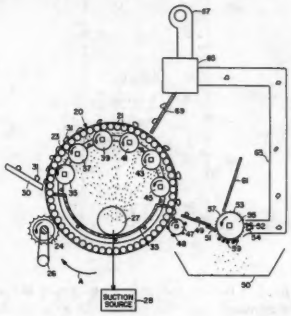
METHOD AND APPARATUS FOR REMOVING A FIBER FRACTION FROM SEED COTTON

Lambert H. Wilkes; Martin Mehner, both of College Station, Tex., and William F. Lalor, Raleigh, N.C., assignors to Cotton Incorporated, New York, N.Y.

Filed Aug. 8, 1989, Ser. No. 390,719

Int. Cl.[5] D01B *1/06*

U.S. Cl. 19—48 R 32 Claims



1. An apparatus for removing a fiber fraction from seed cotton comprising:

a plurality of freely rotatable cage rollers arranged substantially parallel to one another, said plurality of cage rollers being rotatably driven in a continuous path, said continuous path having a first side for receiving the seed cotton and a second side opposite said first side;

a plurality of nip rollers, each of which has an outer peripheral surface that is positioned in abutting relation to the cage rollers on the second side of the continuous path to thereby apply a force to the cage rollers, said plurality of nip rollers including one nip roller located adjacent a place where seed cotton is deposited on the first side of the continuous path and another nip roller located downstream from the one nip roller in the direction of rotation of the cage rollers; and

rotatable reclaiming means for reclaiming seed cotton that has not been completely ginned so that it can be directed back to the first side of the continuous path and thereby subjected to further fiber fraction removal and for discarding ginned seed having no lint, or substantially no lint thereon.

4,984,335

APPARATUS FOR TRANSPORTING TEXTILE LAPS

Karl-Heinz Block, Stuttgart, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach-Fils, Fed. Rep. of Germany

Filed Oct. 20, 1989, Ser. No. 425,710

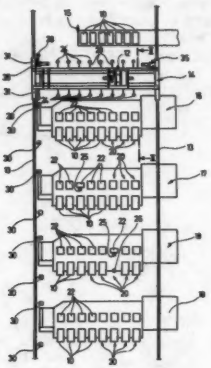
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1988, 3836242

Int. Cl.[5] D01G *19/08*

U.S. Cl. 19—65 A 10 Claims

1. Apparatus for transporting textile laps to a plurality of combers, each comber having a lap operating position for supporting an active lap in combing operation and a lap storage position for supporting a full lap for replacement of the active lap upon exhaustion, said lap transporting apparatus comprising a lap storage station for storing a supply of full replacement laps, an elevated bridge structure movable in series between the lap storage station and the plural combers, a trolley movable along the bridge structure, and a lap gripping device

mounted on the trolley for gripping a lap at the storage station for transporting the lap to one of the combers, the bridge



structure having means for detecting empty lap storage positions of the combers to be supplied with a full replacement lap.

4,984,336

ADJUSTABLE GRID FOR THE EXTRACTION ARM OF A BALE-OPENER MACHINE

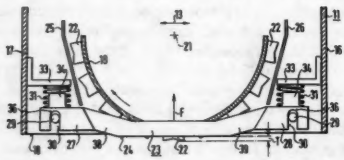
Daniel Hanselmann; Walter Schlepfer, and Jost Aebli, all of Winterthur, Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Aug. 7, 1989, Ser. No. 390,248

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827517

Int. Cl.[5] D01G *7/12*

U.S. Cl. 19—80 R 48 Claims



1. An adjustable grid for an extraction arm of a bale-opener machine, comprising:

drivable fiber flock extraction elements;

an extraction arm having a predetermined lengthwise direction and cooperating with said drivable fiber flock extraction elements;

grid bars each having two opposite ends and being substantially transversely arranged with respect to said predetermined lengthwise direction;

said drivable fiber flock extraction elements extending through and between adjacent ones of said grid bars;

a plurality of spring devices having a predetermined spring force;

said plurality of spring devices placing said grid bars under a load which is at least predominantly perpendicularly directed to the surface of a bale to be opened by means of said drivable fiber flock extraction elements extending through and between adjacent ones of said grid bars;

each of said grid bars being movably mounted at the two opposite ends thereof on opposite sides of said drivable fiber flock extraction elements and biased by said spring devices into a predetermined abutment position;

said predetermined abutment position corresponding to a minimum depth of penetration of said drivable fiber flock extraction elements between said grid bars;

the bales to be opened each having a bale hardness; and

said predetermined spring force of said spring devices being such that said moveably arranged grid bars are moved with increasing bale hardness in a direction of increasing depth of penetration of said drivable fiber flock extraction elements into a position in which the drivable fiber flock extraction elements have a depth of penetration which at least approximately corresponds to said hardness of said bale.

4,984,337

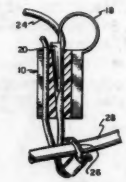
ANTI-SLIP LOCKING DEVICE

Jeff K. Tallman, 14 Trout Brook La., Weston, Conn. 06883

Filed Apr. 23, 1990, Ser. No. 513,118

Int. Cl.[5] B65D *63/00*

U.S. Cl. 24—16 R 8 Claims



1. An anti-slip locking device comprising:

an elongated member having first and second opposite ends and an external surface extending between its ends, the member having a bore extending between its ends in the direction of elongation, said member having at least one slot in its outer surface which extends between the ends of the member and is parallel to the bore, the slot having a first cross-sectional area;

an elastic cord having first and second opposite ends, said cord having a second cross-sectional area larger than said first area when the cord is free of tension and having a third cross-sectional area smaller than the first area when the cord is subjected to tension, the third area decreasing in size as the tension increases, said cord extending slidably through the bore with its first end disposed outside of the member adjacent the first member end, the second end of the cord being disposed outside of the member adjacent the second member end and forming a loop adjustable in size, the loop being adapted to receive an article whereby the loop can be reduced in size by pulling the first end of the cord away from the first member end until the article is held firmly within the loop; and

means removably disposable in the bore at the first member end to hold the cord in the position in which it is placed when the article is held firmly within the loop thereby preventing slippage of the cord, a portion of the cord between the means and the first cord end adjacent the means being alignable with the slot whereby when this portion is subjected to a force of tension, the portion can be fitted into the slot and thereafter locked removably in position by removing the force.

4,984,338

ORNAMENTAL PULL TAB FOR SLIDE FASTENER SLIDERS

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed May 17, 1990, Ser. No. 524,437
Claims priority, application Japan, May 18, 1989, 1-57493[U]
Int. Cl.[5] A44B 19/26
U.S. Cl. 24—431 4 Claims

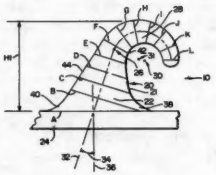
1. An ornamental pull tab, for being pivotally connected to the slider body of a slide fastener slider, made from synthetic resin and having on its upper surface a desired pattern, the ornamental pull tab comprising a grip portion including a base plate having in the upper surface a recess in the form of the pattern and a pattern portion formed on the base plate by injection-molding synthetic resin into the recess.

4,984,339

HOOK FOR HOOK AND LOOP FASTENERS

George A. Provost, Manchester, and Gerald F. Rocha, Bedford, both of N.H., assignors to Velcro Industries B.V., Amsterdam, Netherlands

Filed Oct. 20, 1988, Ser. No. 260,474
Int. Cl.[5] A44B 18/00
U.S. Cl. 24—452 28 Claims



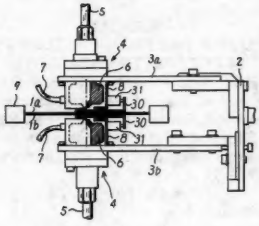
1. An improved hook for hook and loop fasteners having a profile defined by an inner generally concave face and an outer generally convex face, said hook comprising a planar base member intimately engaging a tapered base portion and extending therefrom to join, in a transition region, a tapered hook portion able to engage a loop applying a force to the hook portion substantially normal to the planar base member and terminating in a free end, the taper on the hook portion being much less than the taper on the base portion wherein the hook tapers continuously downwardly in width from the tapered base portion to the free end such that a loop engaging the hook in tension, with the said force being substantially normal to the planar base member, will cause a hinging or buckling of the hook at a location adjacent the outer face in the transition region as the hook deforms under the applied force and such that a loop engaging the hook in shear, with said force substantially parallel to the planar base member, will transmit bending force through the tapered base portion between the location of buckling and the planar base member, the hook being of substantially constant thickness and having a substantially rectangular transverse cross-section, said taper being from about 0.6 in 1 to about 0.2 in 1 in the transition region at about the buckling location.

4,984,340

METHOD AND APPARATUS FOR SEWING TOGETHER PIECES OF CLOTH WITH JET STREAMS

Yoshihiro Nagatsuka, and Kenji Fukuta, both of Tsukuba, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jun. 30, 1989, Ser. No. 374,142
Claims priority, application Japan, Jul. 1, 1988, 63-165668; Aug. 12, 1988, 63-202135
Int. Cl.[5] D04H 3/10
U.S. Cl. 28—104 10 Claims



1. In a method of sewing together pieces of cloth comprising holding the pieces of cloth one on top of another with sewing fibers extending therefrom, wherein said pieces of cloth are superimposed on one another, shooting a fine jet stream of a high-pressure liquid against the superimposed pieces of cloth, moving a shooting position of the jet stream relative to the pieces of cloth and causing the sewing fibers to twine with the pieces of cloth, wherein said method comprises the steps of:

(a) shooting the jet stream to a same point on the superimposed pieces of cloth from both sides of said superimposed pieces of cloth, thereby causing the sewing fibers to twine with one another or with the pieces of cloth; and

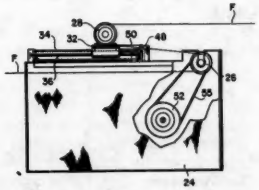
(b) sucking and removing splashing liquid or fluid from an area on said superimposed pieces of cloth where said jet stream is shot.

4,984,341

APPARATUS FOR CONTROLLING TENSION IN A TRAVELING YARN

John F. Hagewood, Matthews, and Julius Darigo, Charlotte, both of N.C., assignors to McCoy-Ellison, Inc., Monroe, N.C.

Continuation-in-part of Ser. No. 252,497, Sep. 30, 1988. This application Dec. 27, 1989, Ser. No. 457,335
Int. Cl.[5] B65H 59/00; D02H 13/14
U.S. Cl. 28—185 18 Claims



1. Apparatus for controlling tension in a traveling yarn, comprising an idler roll and a driven roll arranged for training of the traveling yarn in series peripherally about said rolls, said

driven roll being rotatably mounted about a stationary axis for driving the traveling movement of the yarn and said idler roll being rotatably mounted about an axis movable in a defined path with respect to said driven roll for driven rotation by the traveling movement of the yarn and for movement in opposite directions along said path in response to tension increases and decreases in the traveling yarn, means for applying a biasing force for urging movement of said idler roll in said path into tensioning engagement with the yarn, said biasing force being generally constant at each position of said idler roll along said path and means for sensing movement of said idler roll in each direction along said path from a defined neutral point thereon, said sensing means being operatively associated with said driven roll for varying its yarn driving speed in response to movements of said idler roll along said path to compensate for yarn tension increases and decreases.

4,984,342

METHOD FOR THE MANUFACTURE OF SOLID ELECTROLYTE CAPACITORS

Heinz Auer, Heidenheim-Oggenh, and Gernot Winkler, Heidenheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 13, 1989, Ser. No. 296,800

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1988, 3801729

Int. Cl.[5] H01G *4/10*

U.S. Cl. 29—25.03 **17 Claims**

1. A method for manufacturing solid electrolyte capacitors comprising a sintered anode member composed of a valve metal, an oxide layer arranged on the anode member and serving as a dielectric, a semiconducting electrolyte layer composed of manganese dioxide that is produced by repeated immersion into a solution or melt containing manganese nitrate and by subsequent pyrolytic decomposition, comprising the steps of: arranging a graphite layer on the manganese dioxide layer and a soft-solderable layer thereon, wherein the pores in the interior of the sintered members are first nearly filled with manganese dioxide by pyrolysis of solutions containing manganese nitrate, the sintered members are then immersed at least once into a mixture that is composed of a substantially dry melt of manganese nitrate and manganese dioxide powder, and the pyrolysis is carried out in a furnace after every immersion such that the sintered members are first heated to approximately 100° C. within a few seconds in a dry atmosphere and, following thereupon, fine drops of water are applied onto the surface of the heated sintered members and the pyrolysis is concluded in a mist of water vapor that flows by.

4,984,343

HYDROSTATICALLY SUPPORTED ROLL AND A SEALING ELEMENT THEREFOR

Günter Schrörs, Corneliusstrasse 29, D-4154 Tönisvorst 1, Fed. Rep. of Germany

Filed Jun. 22, 1989, Ser. No. 370,348

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1988, 3820974

Int. Cl.[5] B21B *13/02*

U.S. Cl. 29—116.2 **26 Claims**

12. A roll having controllable line pressure comprising:

a rotatable hollow cylinder forming a working roll circumference at its outer diameter;

a stationary crosshead extending lengthwise through the hollow cylinder to form a surrounding clearance space with an inner circumference of the hollow cylinder;

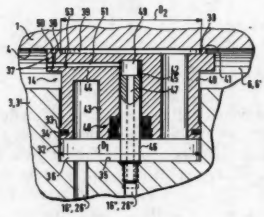
piston-like sealing elements, distributed over the length of a hollow cylinder, radially movable in cylinder bores provided in the crosshead to form cylinder chambers deposed between a bottom end of the sealing elements and a bottom surface of the cylinder bores;

a piston and cylinder unit associated with each sealing element for moving the sealing element in its respective cylinder bore, said piston and cylinder unit being disposed parallel to a longitudinal axis of its respective cylinder bore and having a cylinder volume of smaller cross sectional area than that of its respective cylinder chamber, with one of said piston and cylinder volume being provided on the bottom surface of the respective cylinder bore and the other of said piston and cylinder volume being formed in the respective sealing element;

at least two separate hydraulic fluid supply lines provided in the crosshead, with a first one of said supply lines being connected to the cylinder chambers and a second one of said supply lines being connected to the cylinder volumes; and

each of said sealing elements include:

(i) a contact surface having a shape conforming to the inner circumference of the hollow cylinder for sealingly abutting the inner circumferences;



(ii) an enclosed rim formed in said contact surface defining a hydrostatic pressure chamber therein, said pressure chamber having an open end facing the inner circumference of the hollow cylinder;

(iii) at least two rim chambers separate, and spaced, from said hydrostatic pressure chamber, said rim chambers each having an open end facing the inner circumference of the hollow cylinder;

(iv) at least one unrestricted first duct, extending through the sealing element, connecting its respective pressure chamber and cylinder chamber for supplying hydraulic fluid from the cylinder chamber to the pressure chamber without a drop in pressure; and

(v) at least two restricted second ducts, each of which is separate from said first duct and connected at one of its ends to said cylinder volume and at its other end to one of the rim chambers for throttling hydraulic fluid supplied to the rim chambers.

4,984,344

MOTOR EXTENSION SHAFT REMOVAL TOOL

Richard C. Wells, Orlando, Fla., assignor to Ralph Bidwell, Orlando, Fla., a part interest

Filed Oct. 26, 1989, Ser. No. 426,726

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—261 **6 Claims**

1. A device for separating an automatic washer clutch assembly motor extension shaft from the main drive motor of an automatic washer comprising:

a base tool having a U-shaped base with a bar at the closed portion of the U-shape angling up 90° and measuring longer than said motor extension shaft and then angling 90° back over said U-shaped base;

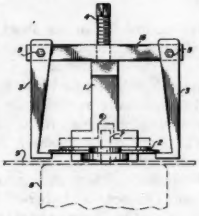
a lifter plate that is circular in diameter with an indented portion at the center of the said lifter plate and having a slot extending from the outer edge to the center of the said lifter plate;

a motor base plate adapted to be secured to the frame of said main drive motor;

an extension shaft puller comprised of a single crossbar having a hole in the center for the passage of a puller screw and two jaws, each jaw located at an end of the

crossbar and dimensioned to be engageable under said lifter plate;

said base tool being dimensioned for sitting flat on said base plate with said U-shaped base dimensioned for extending on either side drive motor shaft and with the base tool extending up and over said main drive motor shaft and said motor extension shaft;



said lifter plate being dimensioned for inserting under said motor extension shaft with the indented portion of said lifter plate fitting into a correspondingly indented portion of said motor extension shaft; and wherein

said puller screw exerts downward pressure on said base tool, said extension shaft puller jaws lip under said lifter plate and exert upward pressure to raise said lifter plate and said motor extension shaft to separate said motor extension shaft from said main drive motor.

4,984,345

JIG FOR FIXING BEARING

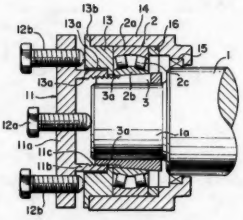
Michinori Sawada; Norio Watanabe, and Yoshiaki Endo, all of Tokyo, Japan, assignors to Tsukishima Kikai Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 404,386, Sep. 8, 1989, abandoned. This application Oct. 27, 1989, Ser. No. 427,388

Claims priority, application Japan, Sep. 9, 1988, 63-117884[U]

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—263 **11 Claims**



1. A jig for fixing a bearing with a tapered bore through a tapered adapter sleeve on a rotational shaft, comprising:

a positioning member for attaching to a housing which receives the bearing, said positioning member having a positioning surface for positioning the bearing in the axial direction, the positioning surface contacting with an end of an inner ring of the bearing, the end of the inner ring being located on the small diameter side of the tapered bore; and

drawing means which engages with the tapered adapter sleeve and has driving means for moving said drawing means axially so that the tapered adapter sleeve is moved toward said positioning member for generating strong fixing forces between the tapered bore and the tapered adapter sleeve and between the tapered adapter sleeve and the shaft.

4,984,346

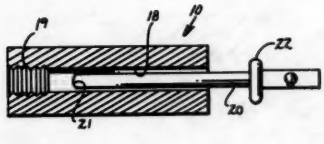
AXLE WEDGE REMOVAL TOOL ASSEMBLY

Rodney R. Vorhauer, 250 Elmdale Crt., W. Jefferson, Ohio 43162

Filed Aug. 7, 1989, Ser. No. 390,976

Int. Cl.[5] B25B *27/14, 45/16*

U.S. Cl. 29—277 **1 Claim**



1. An axle wedge removal tool assembly for securement to an externally threaded axle stud directed through a hub having a conically truncated axle wedge aligning the axle stud in locking association with the hub housing, the assembly comprising,

a coaxially aligned elongate body including an upper end spaced from a lower end, the elongate body including securement means adjacent the lower end for securement of the elongate body to the axle stud, and

an elongate impact tool slidably receivable through the upper end of the elongate body for impacting the tool lower end against an upper end of the stud, and

wherein the elongate body includes a first coaxially aligned through-extending bore extending in a direction from the upper end to the lower end coextensively through the elongate body and defined by a first diameter, and a threaded counter bore extending in a direction from the lower end and coaxially aligned with and in communication with the first bore and spaced from the upper end defined by a second diameter greater than that of the first diameter and defined by a second length less than that of a first length defined by the first bore, and

wherein the elongate impact tool is formed of a cylindrical main body of complementary configuration to the first bore to effect alignment of the impact tool relative to the first bore and the counter bore, and

including a roughened first surface formed exteriorly of the elongate body and extending from the first end to a position remote from the second end, and a smooth external surface extending from the second end formed about the elongate body, and

wherein the impact tool lower end is blunt for impacting communication with the upper end of the stud, and

wherein the impact tool includes a collar positioned about the impact tool remote from the blunt end and wherein the impacting tool is securable to an impact driver.

4,984,347

METHOD FOR ATTACHING A DOUBLER TO A SKIN STRUCTURE

Ronald L. Cox, Long Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 5, 1989, Ser. No. 348,872

Int. Cl.[5] B23P *19/08*

U.S. Cl. 29—402.06 **6 Claims**

1. A method for attaching a doubler to a skin of a structure, where the skin has a fastener hole with a first diameter and a first countersink, comprising the steps of:

(a) placing a doubler on said skin covering said first countersink;

(b) drilling a fastener hole in said doubler at a location con-

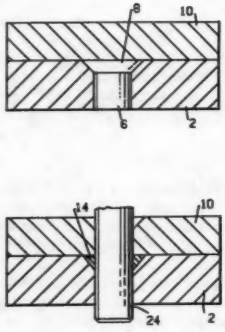
centrically above said fastener hole of said skin to a predetermined second diameter, said drilling enlarging said fastener hole of said skin to said second diameter;

(c) removing said doubler from said skin;

(d) placing a conical washer with an inner diameter into said first countersink;

(e) placing said doubler on said skin and said conical washer;

(f) inserting a coining mandrel having a third diameter through said skin, said conical washer and said doubler, said insertion of said coining mandrel enlarging said fas-



tener hole of said skin fastener hole in said doubler and the inner diameter of said conical washer to said third diameter, said insertion of said coining mandrel producing an interference fit between said conical washer and said skin;

(g) removing said coining mandrel from said fastener hole; and

(h) inserting a solid fastener into said fastener hole such that said solid fastener has an interference fit with said doubler, said conical washer and said skin, whereby said solid fastener attaches said doubler to said skin.

4,984,348

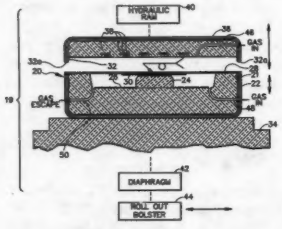
SUPERPLASTIC DRAPE FORMING

Gilbert C. Cadwell, Lakeside, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Continuation of Ser. No. 297,108, Jan. 17, 1989, abandoned. This application Mar. 6, 1990, Ser. No. 492,314

Int. Cl.[5] B23P *17/00*

U.S. Cl. 29—423 **28 Claims**



1. A method of superplastic forming comprising the steps of:

selecting a relatively larger driver sheet and a relatively smaller part blank, both the driver sheet and the part blank being made of a metal capable of exhibiting superplasticity;

placing an independent ceramic die on a bottom wall of an upwardly opening ceramic forming chamber having side walls with upper edges, the die being spaced from the side walls of the forming chamber;

positioning the part blank over the die;

positioning the driver sheet over the part blank so that the peripheral edges of the driver sheet rest on the upper edges of the sidewalls of the forming chamber;

providing a cover for closing the chamber, the cover having a peripheral seal extending from an underside thereof and having an upper ceramic platen connected to the upper side thereof;

pressing the cover against the driver sheet via a hydraulic ram mechanically coupled to the cover to impinge the seal into a periphery of the driver sheet;

allowing the driver sheet and part blank to be heated to a predetermined temperature at which they exhibit superplasticity, said heating being performed via radiant heaters mounted in said upper ceramic platen connected to the upper side of said cover;

introducing a pressurized gas into an interior formed by the closed cover and chamber and thereafter releasing the pressurized gas so that the driver sheet presses and forms the part blank around the die;

lifting the cover and removing the formed driver sheet and part blank; and

rolling the ceramic forming chamber out from under the cover following the pressure releasing step via a roll-out bolster positioned below said forming chamber.

4,984,349

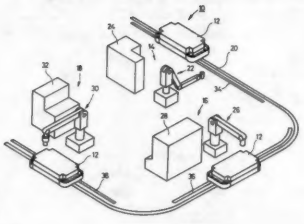
METHOD OF AND APPARATUS FOR EMERGENCY SHUTDOWN OF PRODUCTION LINE

Yoshimasa Ohta, and Masayasu Arakawa, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1989, Ser. No. 384,756

Int. Cl.[5] B21D *39/03;* **B23P** *21/00*

U.S. Cl. 29—430 **4 Claims**



1. A method of emergency shutdown of a production line having a plurality of self-propelled carriages for carrying workpieces respectively thereon, the self-propelled carriages having respective emergency shutdown means connected thereto, and a plurality of automatic machines for processing the workpieces on the self-propelled carriages, respectively, the automatic machines having respective emergency shutdown means connected thereto, said method comprising the steps of:

activating the emergency shutdown means connected to one of the plurality of said self-propelled carriages thereby interrupting movement of said one of the plurality of said self-propelled carriages along said production line independently of other of said self-propelled carriages; and

activating the emergency shutdown means on one of the plurality of said automatic machines which processes the workpiece on said one of the plurality of said self-propelled carriages in response to said activation of said emergency shutdown means on said one of the plurality of said self-propelled carriages, thereby stopping operation

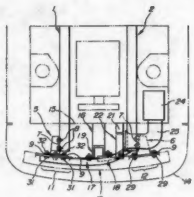
of said one of the plurality of said automatic machines independently of other of said automatic machines.

4,984,350

PROCESS OF INSTALLING A RESONATOR FOR AN AUTOMOBILE

Toshihiko Hayashi, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jul. 3, 1989, Ser. No. 374,838
Claims priority, application Japan, Jul. 4, 1988, 63-165130
Int. Cl.[5] B23P *11/02*
U.S. Cl. 29—525.1 **8 Claims**



1. A process for installing a resonator, connected to an air intake system within an engine compartment of a vehicle, for reducing intake air noise levels, comprising the steps of:

mounting a first mounting member on a side member of a vehicle frame;

ataching the resonator to said first mounting member to form a first pre-assembly;

installing a second mounting member on a bumper to form a second pre-assembly; and

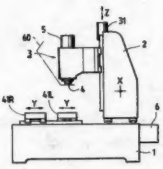
securing said second mounting member to the other side member and said first mounting member to said bumper to mount said second pre-assembly to said first pre-assembly so as to dispose the resonator within said bumper.

4,984,351

MACHINE TOOL

Futoshi Matsuyama, Nagoya; Akira Hirose, Kounan, and Toshiyuki Takei, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 15, 1989, Ser. No. 366,480
Claims priority, application Japan, Jun. 27, 1988, 63-85318[U]
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 29—568 **17 Claims**



2. A machine tool comprising:

at least two tables extending and movable in a horizontal plane and provided side by side, each of the tables being movable in a first mode wherein the tables move independent of each other and a second mode wherein the tables move together in an integral manner;

table drive mans having numbers equal to the numbers of the tables for individually or synchronously moving the tables in an extending direction thereof;

a spindle head movable in the horizontal plane in a first direction perpendicular to the extending direction of the tables and movable in a vertical direction;

a first drive means connected to the spindle head for moving the spindle head in the first direction;

a second drive means connected to the spindle head for moving the spindle head in the vertical direction; and

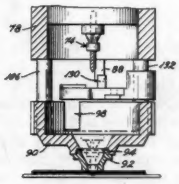
a numerical control unit for numerically controlling each of the table drive means, and the first and second drive means, whereby machining to a large scale workpiece spanning more than one table is achievable by integral motions of the tables in response to the synchronous operation of the table drive means, the numerical control unit controlling the table drive means independent of each other or synchronously depending upon the movement mode, whereby machining to a large scale workpiece spanning more than one table is achievable by integral motions of the tables in response to the synchronous operation of the table drive means.

4,984,352

THIN PANEL DRILLING METHOD AND APPARATUS

Herbert M. Reed, Duncansville; Scott J. Sager, Altoona; Alexander Grebenyuk, Hollidaysburg, and Stephen F. Torchia, Seward, all of Pa., assignors to Micromation Systems, Inc., Altoona, Pa.

Division of Ser. No. 164,840, Mar. 7, 1988, Pat. No. 4,932,117.
This application Feb. 26, 1990, Ser. No. 484,905
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 29—568 **7 Claims**



1. In a method of drilling holes in thin panel material with drill bits having enlarged portions said method comprising the steps of applying pressure to said material via a pressure foot surface defining a footprint and generally surrounding and proximate each hole during drilling thereof in order to minimize disruption of a planarity of said material by a drill bit, said drill bit passing through a hole of said footprint during said drilling, and removing said bit from a drill and replacing it with new bit as required, the improvement comprising the steps of:

providing said footprint hole with a diameter less than that of said enlarged portions of said drill bits in order to further minimize said planarity disruption by use of said pressure foot; and

retaining said pressure foot hole and drill generally coaxial while performing said removing and replacing without passing said enlarged portions of said bits through said footprint hole.

4,984,353

PRODUCTION LINE FOR ELECTRIC MOTOR SUBASSEMBLIES

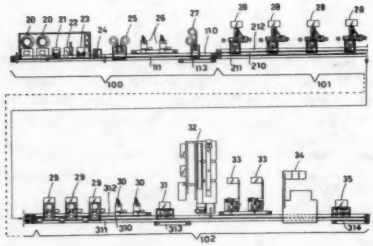
Luciano Santandrea, Tavarnelle Val di Pesa, and Massimo Lombardi, Casellina, both of Italy, assignors to Axis S.p.A., Tavernelle Val di Pesa, Italy

Continuation of Ser. No. 324,599, Mar. 16, 1989, abandoned.
This application Nov. 20, 1989, Ser. No. 437,777
Claims priority, application Italy, Sep. 16, 1988, 67824 A/88
Int. Cl.[5] H02K *15/085*
U.S. Cl. 29—714 **11 Claims**

1. A production line for producing at least two variations of

a type of wound electric motor component, said production line comprising:

a plurality of workstations for producing wound electric motor components, at least a first one of said workstations having at least one machine capable of being adjusted automatically on demand to work on any one of at least two said variations of said type of wound electric motor component, and at least a second one of said workstations having at least two machines for working on wound electric motor components, each of said at least two machines being capable of working on different ones of said at least two variations of said type of wound electric motor component, one of said at least a second one of said workstations being a winding station, said winding station comprising a respective number of winding machines for each said variations of said type of wound electric motor component, said respective numbers relating to one another



according to the expected frequencies of occurrence of each said variation;

conveyor means for transporting said wound electric motor components between said workstations;

pallet means for supporting said wound electric motor components during transportation by said conveyor means and during working at said workstations; and

means associated with each of said workstations for determining which variation of said type of wound electric motor component is present at said workstation and, responsive to said determinations, for, when said determination is made at said first workstation, automatically adjusting a machine at said first workstation to work on said variation of said type of wound electric motor component, and, when said determination is made at said second workstations, automatically directing said pallet to an appropriate one of said machines.

4,984,354

ELECTRONIC PARTS MOUNTING APPARATUS

Masayuki Mohara, and Yoshinori Kano, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

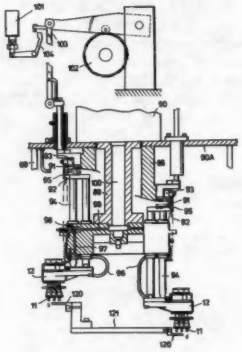
Filed Apr. 27, 1990, Ser. No. 515,947

Claims priority, application Japan, Apr. 28, 1989, 1-110009; Aug. 7, 1989, 1-204469

Int. Cl.[5] H05K *3/30*

U.S. Cl. 29—740 **4 Claims**

1. An electronic parts mounting apparatus which, on the basis of a recognition result of an attitude of tipped electronic parts obtained by a recognition device, changes the attitude of said parts in a rotational direction, said apparatus comprising a removing nozzle, formed in its upper portion with a groove to be fitted, for attracting and holding at its lower end said parts to be recognized by said recognition device; a vertically movable and rotatable nozzle rotating means for changing the attitude of said parts in a rotational direction on the basis of a recognition result obtained by said recognition device, said nozzle rotating means being provided above said removing nozzle and having a fitting portion to be fitted in said groove to be fitted; a cushion means mounted on one of said nozzle rotating means and said removing nozzle for pressing said fitting portion against said groove to be fitted when said nozzle rotating means is moved down into contact with said groove of



said nozzle to be fitted; and a sliding means for fitting said fitting portion into said groove to be fitted while sliding said fitting portion at least in one direction while being adjusted to said groove to be fitted by the bias of said cushion means.

4,984,355

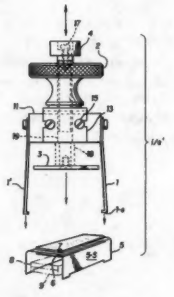
TOOL FOR INSERTING/EXTRACTING PACKAGE FROM SOCKET ON PC BOARD

Rocco V. Lubrano, Norristown, and Ladislaw D. Cubranich, Lansdale, both of Pa., assignors to Unisys Corporation, Detroit, Mich.

Filed Mar. 6, 1989, Ser. No. 319,500

Int. Cl.[5] H05K *13/04*

U.S. Cl. 29—741 **18 Claims**



1. A bi-part composite insertion/extraction tool for inserting a circuit package into receiving socket means and for extracting it therefrom, this tool comprising reversible drive means and separate co-operating adapter means;

said drive means comprising body means and means for urging said body means toward, and away from, said package;

said body means including grip means projecting form said body means for selectively engaging said package and urging it toward said body means during "package-extraction" and for engaging said socket means and urging it toward said body means during "package-insertion";

said adapter means having means for cooperatively coupling with said body means in a "first position" during said "package-extraction" during which said adapter means

functions to aid extraction, and for cooperatively coupling with said body means in a "second position," different from said "first position," during said "package insertion."

4,984,356

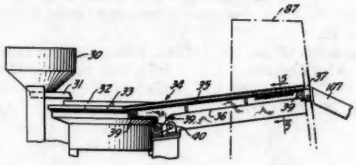
APPARATUS FOR MANUFACTURING A PRE-ASSEMBLED, TWO-PART MERCHANDISE DISPLAY HOOK

Thomas O. Nagel, Blairstown, N.J., assignor to Trion Industries Inc., Wilkes-Barre, Pa.

Division of Ser. No. 41,854, Apr. 22, 1987, Pat. No. 4,785,511. This application Jul. 7, 1988, Ser. No. 216,123

Int. Cl.[5] B23P *21/00*

U.S. Cl. 29—788 **10 Claims**



1. Apparatus for making and assembling a two-part merchandise display hook, wherein one of the parts is a molded plastic base provided with a wire-receiving socket therein and having edge margins, and provided with guide flanges along said margins, and the other of the parts is a section of bent and shaped wire, which comprises

(a) means for feeding wire lengthwise from a substantially continuous supply thereof to provide a wire section of predetermined length having a rearward end portion and a forward end portion,

(b) gripping and forming die means movable between open and closed positions,

(c) said die means accommodating lengthwise feeding of the wire while open and operative upon closure to bend said wire section at its forward end extremity and thereafter to tightly grip at least the forward end portion of said wire,

(d) supporting die means, positioned adjacent the rearward end portion of said wire section for supporting and confining said rearward end portion,

(e) a fixed cutting die member spaced from said support means,

(f) said fixed cutting die member having an opening therethrough for the passage of wire from said supply,

(g) a movable cutting die member mounted for movement between said fixed cutting die member and said support means and operative to sever a predetermined wire section from said supply,

(h) said movable cutting die member having means thereon engageable with the severed rearward end portion of said wire section,

(i) means for advancing said movable cutting die member from a retracted position, through its wire cutting position, and substantially beyond said cutting position, whereby the severed rearward end of said wire section is bent in the direction of movement of said cutting die member to form a hook-mounting portion,

(j) a retractable bend-forming die member removably positioned adjacent said wire on the forward side of said movable cutting die and providing a fulcrum about which said wire is bent during advancement of said cutting die,

(k) means for retracting said cutting die and said bendforming die member after forming of said hook-mounting portion of the severed wire section,

(l) conveyor means for supplying molded plastic base members to an assembly position aligned generally with said hook-mounting portion,

(m) means at said assembly position for engaging and guiding opposite side flange portions of said base member;

(n) plunger means operative to displace a base member at said assembly position into assembled relation with said hook-mounting portion,

(o) means for separating said gripping and forming dies, to release said wire therefrom, and

(p) means for ejecting the assembled hook and base from said separated dies.

4,984,357

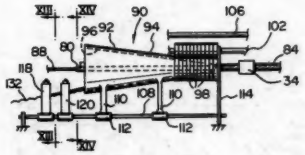
METHOD AND APPARATUS FOR FORMING METAL SHIELD FROM TAPE

Ali Pan, Kingston, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 10, 1990, Ser. No. 463,053

Int. Cl.[5] H01B *13/20*; B21D *49/00*

U.S. Cl. 29—828 **6 Claims**



1. A former for forming metal shield from tape as it is moved along a passline comprising a stationary concave forming surface which extends along and faces inwardly onto the passline with at least a downstream end region of the forming surface being frusto-conical and tapering in a downstream direction of the passline, and a rotatable roller for urging a longitudinally extending median region of the tape against the forming surface, said rotatable roller being rotatable about an axis transverse to the passline and having a convex outer surface which continuously confronts and lies parallel to an adjacent region of the forming surface with the passline lying between the convex surface and said adjacent region of the forming surface.

4,984,358

METHOD OF ASSEMBLING STACKS OF INTEGRATED CIRCUIT DIES

Bradley H. Nelson, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Continuation-in-part of Ser. No. 429,293, Oct. 27, 1989, which is a continuation of Ser. No. 321,500, Mar. 10, 1989, Pat. No. 4,930,216. This application Jun. 18, 1990, Ser. No. 539,769

Int. Cl.[5] H05K *3/36*

U.S. Cl. 29—830 **20 Claims**

1. A method for assembling a stack of integrated circuit dies, comprising:

making holes through a wafer having a plurality of integrated circuit dies in which the dies include pads thereon connected to integrated circuits in the dies, said holes being placed between the dies and adjacent the pads;

placing a layer of insulating material over the wafer and in the outer periphery of the holes;

adding an electrically conductive connection between the top of each pad and the inside of the insulating material in an adjacent hole;

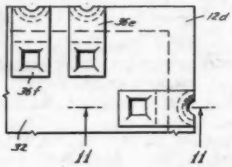
separating the plurality of dies from each other along lines extending through the holes between the dies; and

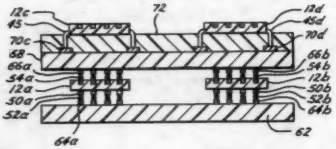
connecting a plurality of dies by an electrical interconnection between the electrically conductive connections on the inside of the cut holes of the dies.

7. A method for assembling a stack of integrated circuit dies, comprising:

making holes through a wafer having a plurality of integrated circuit dies in which the dies include pads thereon connected to integrated circuits in the dies, said holes being placed between the dies and adjacent the pads;

placing a layer of insulating material over the wafer, in the outer periphery of the holes, and beneath the wafer along its backside;





adding an electrically conductive connection between the top of each pad, the inside of the insulating material in an adjacent hole, and the bottom of the insulating layer beneath the wafer so that the pads are electrically interconnected to conductors beneath the wafer; and

separating the plurality of dies from each other along lines extending through the holes between the dies.

4,984,359

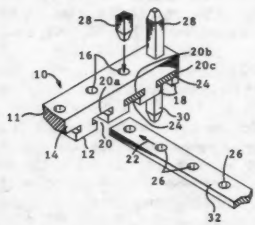
METHOD OF MAKING A SOLDER CONTAINING ELECTRICAL CONNECTOR

Thomas C. Clark, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 222,655, Jul. 20, 1988, Pat. No. 4,872,846. This application May 19, 1989, Ser. No. 339,045

Int. Cl.[5] H01R *43/02*

U.S. Cl. 29—879 **16 Claims**



1. A method of assembling an electrical connector comprising the following steps:

(a) providing at least one reflowable element, at least one pin, and a housing which defines at least one channel having a loading axis and at least one pin receiving aperture passing through the channel and disposed at an angle with respect to the loading axis, said channel shaped to receive the reflowable element and to positively retain the reflowable element against movement along the direction of the pin receiving aperture;

(b) moving the reflowable element along the loading axis into the channel within the housing; and

(c) moving the pin into the housing through the pin receiving aperture and through the channel, thereby preventing the reflowable element from moving out of the channel along the loading axis and locking the reflowable element in place.

4,984,360

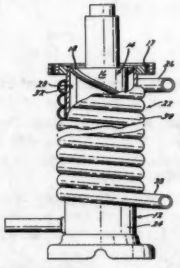
METHOD OF FABRICATING FLAKER EVAPORATORS BY SIMULTANEOUSLY DEFORMING WHILE COILING TUBE

Keith O. Sather, Albert Lea, Minn.; Edward R. Gade, Mundelein, Ill.; David A. Tandeski, and Lawrence E. Olson, both of Albert Lea, Minn., assignors to Scotsman Group, Inc., Vernon Hills, Ill.

Continuation of Ser. No. 314,043, Feb. 22, 1989, abandoned. This application Jun. 5, 1990, Ser. No. 533,932

Int. Cl.[5] B21D *53/06*

U.S. Cl. 29—890.053 **7 Claims**



1. A method of forming a heat transfer apparatus, the steps of the method comprising simultaneously advancing and deforming a straight length of metal tubing having a wall of cylindrical cross-section, inserting a tapered bullet mandrel interiorly of said tube for engagement with the interior wall of said tube during the deforming step, said deforming including permanently flattening the wall on one side of the length of said tubing against a coil mandrel, thereby forming the tubing into a substantially D-shaped cross-section conforming interiorly to said tapered bullet mandrel, and simultaneously with said flattening coiling the length of said tubing said coil mandrel in such fashion that when coiled the one permanently flattened side of the tube defines a substantially continuous cylindrical surface.

4,984,361

METHOD OF MAKING A FLAT SPRING COMPRESSOR VALVE

Derek Woollatt, Campbell, N.Y., and George J. Safford, Quincy, Ill., assignors to Dresser Industries, Dallas, Tex.

Division of Ser. No. 258,125, Oct. 11, 1988, Pat. No. 4,913,187, which is a division of Ser. No. 86,526, Aug. 17, 1987, Pat. No. 4,889,156. This application May 15, 1989, Ser. No. 353,158

Int. Cl.[5] B29C *45/14*

U.S. Cl. 29—890.124 **1 Claim**

1. A method of forming a plate valve comprising the steps of:

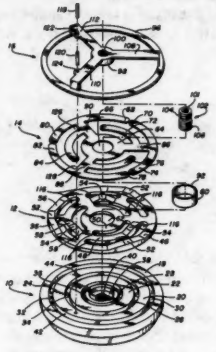
a. forming fluid passage ports in a seat member,

b. forming a rigid, movable plate member for controlling the flow of fluid through said ports;

c. forming at least one projection on one side of said plate member

d. mounting a flat spring plate in fixed relationship with respect to said seat member, and

e. forming at least one flat resilient spring finger on said spring plate for contacting said at least one plate member



projection to bias said plate member against and seal said fluid passage ports until sufficient fluid pressure in said ports forces said plate member against and bends said at least one flat spring finger thereby uncovering said fluid passage ports to allow fluid passage through said valve.

4,984,362

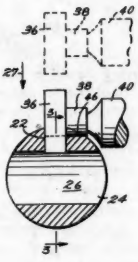
METHOD FOR FORMING A BALL VALVE CONNECTION

Robert E. Sands, Shelbyville, and Carl E. Floren, Decatur, both of Ill., assignors to Mueller Co., Decatur, Ill.

Division of Ser. No. 415,615, Oct. 2, 1989. This application Feb. 7, 1990, Ser. No. 476,603

Int. Cl.[5] B23P *13/02*; B23C *3/28*

U.S. Cl. 29—890.128 **5 Claims**



1. A method of forming a connection in a ball valve member for cooperation with an operating stem member with the use of a cutting tool of the type having a first annular cutting surface of a selected radius and a second annular cutting surface having a radius smaller than said selected radius and the cutting surfaces being mounted on a common axis for rotation and mounted contiguous to one another, the steps comprising:

(a) orienting the axis of the through bore of the ball valve member in a selected position relative to the axis of rotation of the cutting tool,

(b) moving the cutting tool substantially perpendicularly toward the axis of the through bore of the ball valve member to commence cutting an arcuate slot in the surface of the ball valve member using the first annular cutting surface,

(c) continuing the cutting of step (b) while forming a recess in the surface of the ball valve member with the second cutting surface with the recess extending substantially perpendicular to the slot being formed with the first cutting surface.

4,984,363

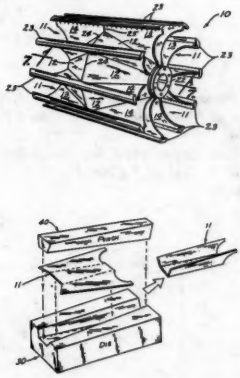
METHOD OF MAKING WING PULLEYS

Karl C. Valster, and Allen V. Reicks, both of Pella, Iowa, assignors to Precision Pulley, Inc., Pella, Iowa

Division of Ser. No. 454,428, Dec. 21, 1989, Pat. No. 4,956,914. This application Mar. 28, 1990, Ser. No. 500,694

Int. Cl.[5] B21F *1/42*

U.S. Cl. 129—892.1 **3 Claims**



1. A method of making wing pulleys of a type having a body portion constructed of two generally frusto-conical subassemblies connected together at the inner ends thereof, a plurality of radially outwardly extending wings connected radially on the inside thereof to said frusto-conical subassemblies and having a belt contacting portion on the outer edge thereof, each of said generally frusto-conical subassemblies having gusset panels and associated wing panel segments forming one-half of two adjacent wings disposed between each of said adjacent outwardly extending wings, each of said gusset panels having an outer constant width portion an inner width portion which varies for pulleys of different widths, a length which varies for different pulley widths, the width of each of said gusset panels being tapered at a constant rate between said outer constant width portion and said inner width portion, said inner width portion being greater than said outer width portion, wherein said method comprises:

forming said gusset panels in a common die which will accommodate gusset panels of different lengths depending upon the pulley width of the wing pulley to be made; and

connecting together the two generally frusto-conical subassemblies of said wing pulley.

4,984,364

DISPOSABLE REFRIGERATED SAFETY RAZOR HEAD

Richmond R. Simmons, 1296 B Stoneridge Dr., Columbus, Ohio 43213

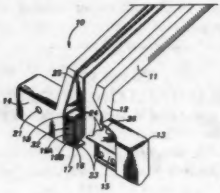
Filed Jun. 6, 1989, Ser. No. 362,168

Int. Cl.[5] B26B *21/00, 19/44, 21/40*; B65D *81/24*

U.S. Cl. 30—32 **11 Claims**

1. In a disposable razor head equipped with a synthetic resin housing and with at least one metal blade having an exposed

cutting edge disposed in a gap in the housing, that improvement which comprises: a partition mounted within the housing in angular relation to the blade and defining in combination



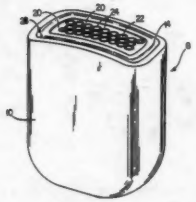
with the housing at least one refrigerant means is stored inside a receiving chamber in which a substantial portion of the blade is disposed.

4,984,365

SAFETY RAZOR

Elizabeth C. Leonard, Cambridge, and Jill M. Shurtleff, South Boston, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed May 4, 1990, Ser. No. 519,053
Int. Cl.[5] B26B *19/38*
U.S. Cl. 30—34.05 20 Claims



1. A safety razor comprising

a body member having a through aperture therein and support surface structure around said aperture,

a thin flexible metal foil member with a plurality of apertures therein, the edge of each said aperture being sharpened to define a shaving edge, said foil member being disposed on said support surface structure of said body member to overlie said aperture in supporting relation, and

protective sheet structure that has a skin-engaging surface, an outer perimeter greater than the outer perimeter of said metal foil blade member and an inner perimeter smaller than the outer perimeter of said metal foil blade member, said protective sheet structure being secured in overlying relation on both said support surface structure and said foil member so that the apertures of said foil member are exposed in shaving relation immediately adjacent and surrounded by said skin-engaging surface of said protective sheet structure, and said foil member remains firmly secured relative to said support surface structure as the razor is moved across the skin in shaving action.

4,984,366

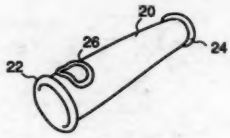
ELASTOMERIC RECEPTACLE FOR NAIL CLIPPER

Robert B. Powers, 1244 Tucson Ave., Sunnyvale, Calif. 94089

Continuation of Ser. No. 264,282, Oct. 28, 1988, abandoned.
This application Feb. 6, 1990, Ser. No. 474,696
Int. Cl.[5] A45D *29/00*
U.S. Cl. 30—124 10 Claims

1. A nail clipper receptacle for use with a standard nail clipper of the type including a pair of spring jaws fixed together at a narrow first end, diverging at a second end, and having cutting edges formed at said second end for cooperating to oppose one another when a lever is operated to overcome inherent resiliency of said spring jaws and cut a nail, said nail clipper receptacle comprising:

an elastomeric sheath of a conical shape formed of a highly resilient material, said sheath having a wide end and a



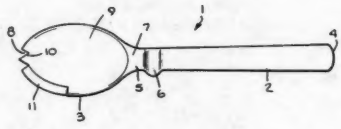
narrow end, said sheath having a first opening at said wide end so that, when said sheath is fitted over a standard nail clipper, cutting edges of said nail clipper protrude through said first opening of said sheath, said highly resilient material allowing said sheath to be stretched over said standard nail clipper so as to generally conform to outer dimensions of said nail clipper and retain nail clippings within boundaries provided by said nail clipper and said nail clipper receptacle.

4,984,367

COMBINATION UTENSIL

Joseph Albanese, 102 Village Ave.-Apt. 3C, Rockville Center, N.Y. 11570

Continuation of Ser. No. 285,121, Dec. 16, 1988, abandoned.
This application Jan. 8, 1990, Ser. No. 463,947
Int. Cl.[5] A47J *43/28*
U.S. Cl. 30—147 9 Claims



1. A combination eating utensil comprising:

(i) a handle portion having a frontside and a backside and having a length defined by a first non-linear end and a second end leading into an implement portion,

(a) the backside of said handle portion having at least one curved recess along its length,

(b) said second end having a tab structure adapted for reception of a user's finger, said tab structure not continuing onto said implement portion;

(ii) an implement portion comprising:

(c) a proximal end connected to said second end of said handle portion;

(d) two opposed lateral sides which define a concave recess which tapers from a widest portion at said proximal end to a narrowest portion at said distal end, said distal end terminating in an alternating series of a plurality of V shaped indentations and V shaped extensions which define a plurality of tines extending directly from said distal end, wherein the number of said indentations is one more than the number of extensions;

(e) two end tines each of which is defined by one of said opposing lateral sides and one side of one of said V shaped indentations; and

(f) a single cutting means which extends from one of said two end tines and along a portion of the opposing lateral

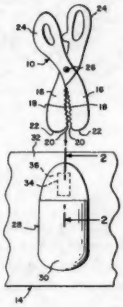
side defining said end tine, but not along the entire opposing lateral side.

4,984,368

LIFE CUT

James R. Hoover, 5154 Dream Ct., Sacramento, Calif. 95842, and George Spector, 233 Broadway #3815, New York, N.Y. 10007

Filed Aug. 9, 1989, Ser. No. 391,023
Int. Cl.[5] B26B *13/00*
U.S. Cl. 30—231 **2 Claims**



1. An emergency scissors for cutting through a jammed seat belt of a motor vehicle which comprises:

(a) a pair of blades, each having teeth along a cutting edge and a blunt tip to avoid injury to the eyes;

(b) a pair of handles, each disposed on one of said blades opposite said blunt tip; and

(c) a swivel pivot pin joining said pair of blades together so that a person can grip said handles to open and close said blades so that said teeth along said cutting edges can cut through the jammed seat belt; wherein

(d) said blades are fabricated out of hardened stainless steel;

(e) said handles are fabricated out of tough, high-impact plastic; further including

(f) a sheath having a pouch for storing said blades when said emergency scissors are not being used, and

(g) means for attaching said sheath to an interior surface of the motor vehicle so that the person has access to said handles of said emergency scissors; wherein said attaching means includes hook and loop pile fastener strips in which one of said strips is attached to rear of said sheath and other of said strips is attached to the interior surface of the motor vehicle.

4,984,369

DEVICE FOR REMOVING GROUT

Matthew L. Flint, and Glenda S. Flint, both of 4021 Valley Dr., Pueblo, Colo. 81008

Filed Feb. 15, 1990, Ser. No. 480,318
Int. Cl.[5] B23D *47/02, 51/02*
U.S. Cl. 30—374 **5 Claims**

1. An attachment device for an electrically powered jig saw having a housing, a guide plate for enabling the jig saw to ride upon a flat work surface, and drive means for causing reciprocal motion of a saw blade in a straight line perpendicular to said guide plate, said attachment device comprising:

(a) a mounting plate of elongated configuration having forward, rear and side extremities, substantially flat upper and lower surfaces, an axis of symmetry in the direction of said elongation, a straight elongated slot centered upon said axis of symmetry and opening upon said forward extremity, and means for attachment to said jig saw,

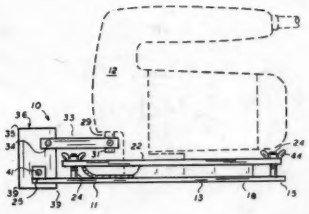
(b) holding means disposed upon the upper surface of said mounting plate,

(c) yoke means disposed upon the upper surface of said mounting plate adjacent said forward extremity and embracing said elongated slot, said yoke means having penetrating channels aligned upon a line parallel to said mounting plate and perpendicular to said slot,

(d) a vertical bar having an upper extremity adapted to engage said drive means, and a lower extremity,

(e) a horizontal bar having forward and rear extremities and disposed generally above said slot and parallel to said mounting plate, the rearward extremity of said horizontal bar pivotably engaging the lower extremity of said vertical bar, and

(f) a cutting blade having substantially flat parallel sides, an upper extremity, a lower extremity provided with opposed cutting edges, and upper and lower holes in substantially vertically spaced relationship, said cutting blade being vertically disposed between said yoke means and pivotably joined thereto by a stationary pivot pin extending through the channels of said yoke means and the lower penetrating hole of said blade, the manner of said pivotable joinder permitting the lower extremity of the blade to protrude through said slot below said mounting plate, said blade being pivotably attached at its upper hole to the forward extremity of said horizontal bar, whereby



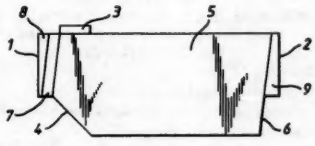
(g) reciprocal motion applied by said drive means to said vertical bar causes the cutting edges of the blade to oscillate in a circular arc.

4,984,370

GUN SIGHT

Fraser Scott, Guildford, and Raymond G. Budden, Havant, both of England, assignors to Ring Sights Worldwide Limited, Bordon, England

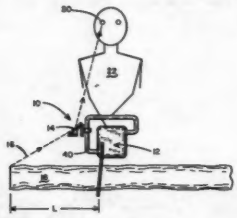
Filed Feb. 5, 1990, Ser. No. 475,008
Claims priority, application United Kingdom, Feb. 7, 1989, 8902687
Int. Cl.[5] F41G *1/30*
U.S. Cl. 33—241 **6 Claims**



1. A gun sight comprising a block of transparent material having a line of sight therethrough between a target end and a viewing end, and a graticule pattern mounted to the, in use, top surface of the sight whereby it may be illuminated by light from the sky generally above the sight, the block having a first internally reflecting surface disposed below the graticule pattern and aligned to reflect light therefrom to a second reflecting surface, which in turn is aligned to reflect light from the graticule to a partially reflective doublet lens system in the line

of sight, which reflects said doubly reflected light to form an image of the graticule at infinity in the line of sight.

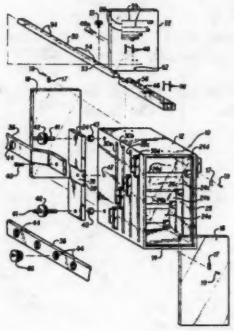
4,984,371
CHAIN SAW LOG GAUGE FOR OBTAINING FIREWOOD LOGS OF UNIFORM LENGTH
Robert N. Fredrickson, 606 Lake Ave., Ironwood, Mich. 49938
Filed Jul. 25, 1989, Ser. No. 384,434
Int. Cl.[5] G01C *3/02*
U.S. Cl. 33—263 **19 Claims**



1. A chain saw log gauge means which is securable to a chain saw for enabling an operator to saw firewood logs to a substantially uniform desired length comprising:
first and second elongated leg means each of which have first and second ends,
hinge means which is connected to said first and second leg means adjacent their first ends in such a manner that said second ends of said first and second leg means are movable relatively toward and away from each other,
light reflector means secured to said first leg means intermediate said first and second ends of said first legs means,
visual indicia means associated with said light reflector means,
mounting means for securing said second leg means of said log gauge means in a fixed position on said chain saw,
and adjusting means for moving said first leg means relative to said second leg means to adjust the position of said light reflector means so that length of said logs can be cut to said desired length by aligning said visual indicia means relative to the eyes of the operator and an image of an end of one of said logs in said light reflector means.

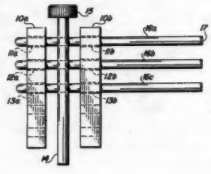
4,984,372
RANGE FINDING ARCHERY BOW SIGHT FOR HUNTING
C. Andrew Blizzard, Rte. 1, Box 84-A, Trappe, Md. 21673
Filed Oct. 19, 1988, Ser. No. 221,364
Int. Cl.[5] F41G *1/467*
U.S. Cl. 33—265 **7 Claims**

1. An archery bow sight comprising;
a box housing having two sidewalls and having removable transparent front and rear panels;
a plurality of sighting windows disposed within said box housing parallel to said front and rear panels, each of said windows having intersecting reticles providing a first sighting point;
means for retaining and vertically adjusting each said sighting windows within said box housing sidewalls;
a transparent range finding viewing element having a plurality of pairs of vertical etched lines, and a plurality of pairs of horizontal etched lines depicted thereon for estimating the range of an animal;
a dot marking depicted on said viewing element, providing a second sighting point to be visually aligned with one of said first sighting points for aiming;



means for adjustably holding said transparent range finding viewing elemental parallel to said box housing; and
means for attaching said box housing to an archery bow.

4,984,373
ARCHERY BOW SIGHT
Richard M. Forrest, 8195 E. Nicaragua, Tucson, Ariz. 85730
Filed Jul. 25, 1989, Ser. No. 385,260
Int. Cl.[5] F41G *1/28, 1/467*
U.S. Cl. 33—265 **26 Claims**

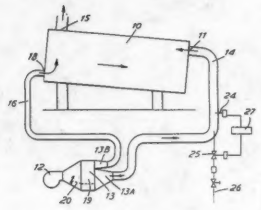


1. An archery bow sight comprising:
(a) a primary brace having at least two holes therethrough;
(c) at least two sighting pins, each of said sighting pins extending through a hole in the primary brace; and,
(d) locking means for securing said sighting pins including cam means for simultaneously applying pressure against a portion of all of said sighting pins.

4,984,374
ROTARY DRIER CONTROL BY ADJUSTMENT OF AIR FLOW OR AIR HUMIDITY
Derek G. Bird, Stockbridge, and Anthony S. Westlake, Winchester, both of England, assignors to GBE International plc, Andover, England
PCT No. PCT/GB89/00145, § 371 Date Oct. 10, 1989, § 102(e) Date Oct. 10, 1989, PCT Pub. No. WO89/07401, PCT Pub. Date Aug. 24, 1989
PCT Filed Feb. 13, 1989, Ser. No. 411,492
Claims priority, application United Kingdom, Feb. 13, 1988, 8803380
Int. Cl.[5] F26B *21/08*
U.S. Cl. 34—50 **7 Claims**

1. A rotary cut tobacco dryer comprising
(a) a heated rotary dryer chamber having longitudinal tobacco feed and delivery ends and being arranged to lift

and then drop material therein to be dried as the chamber rotates;
(b) an air source;
(c) a heater connected to the air source;
(d) a distributor connected to the heater;
(e) first and second conduit means connected to the heater and connected respectively to the feed and delivery ends of the chamber for supplying heated air from the said heater to both ends of the chamber;
(f) means for extracting the air from the feed end of the chamber, said air source, first and second conduit means

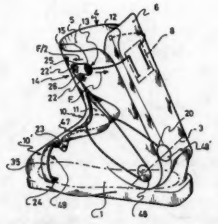


and extraction means being of such capacities that there is a substantially constant flow of air through the chamber;
(g) an electronic sensing circuit including a transducing sensor and a computer for sensing moisture content of the tobacco and for producing control signals proportional to the moisture content; and
(h) an air humidity control device for receiving said control signals to control the humidity of the air fed to the chamber so that an increase in humidity decreases the rate of drying in the chamber and a decrease in humidity increases the rate of drying in the chamber.

4,984,375
DOWNHILL SKI BOOT

Maurice Bonnet, Rumilly, France, assignor to Salomon S.A., Annecy Cedex, France

Continuation of Ser. No. 254,808, Oct. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 748,458, Jun. 25, 1985, abandoned. This application Feb. 13, 1990, Ser. No. 480,335
Claims priority, application France, Oct. 8, 1987, 87 14154
Int. Cl.[5] A43B *5/004, 11/000*
U.S. Cl. 36—119 **41 Claims**

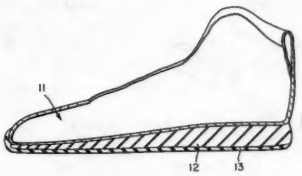


1. A ski boot for holding the foot and the lower leg of a skier, wherein said ski boot comprises:
(a) an upper surrounding said lower leg of the skier;
(b) a base for surrounding the foot of the skier;
(c) means for closing said upper on said lower leg of the skier comprising a first traction element;
(d) means for holding said foot in said boot comprising a second traction element and including a first retention device for a first portion of the foot and a second retention device for a second portion of the foot;
(e) means for linking said closing and holding means, wherein said linking means comprises means for actuating one of said closing means and said holding means in response to actuation of the other, wherein said second traction element, defined by two strands by means of a return member of said linking means, associates through each of said respective strands at least one of said first retention device and said second retention device with the foot of the skier.

4,984,376
MIDSOLE FOR FOOTWEAR

Timothy H. Walter, Wilmington, Del., and Thomas M. Pontiff, Gansevoort, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 15, 1989, Ser. No. 366,834
Int. Cl.[5] A43B *13/12, 05/00*
U.S. Cl. 36—30 R **8 Claims**



1. A flexible midsole for footwear, said midsole comprising a foamed thermoplastic multi-block copolymer elastomer having a substantially uniform closed cell structure and having a specific gravity of less than about 0.35, an energy return ratio greater than about 0.55 when compressed and released, as determined by the recommended method of ASTM Committee FO8.54 on athletic footwear, said foam being prepared from a thermoplastic multi-block copolymer elastomer having a Shore D hardness of 25–45 and selected from the group consisting of (1) copolyetheresters, (2) copolyesteresters, (3) copolyetherimide esters and (4) copolyetheramides, said thermoplastic foam being prepared by mixing said multi-block copolymer elastomer at a temperature above its melting point to form a molten mass with a gaseous or low-boiling liquid forming agent at a pressure sufficient to dissolve and/or disperse said foaming agent in said molten elastomer and extruding the resulting mixture through an orifice into a lower pressure zone whereupon foaming and expansion occur and the elastomer solidifies.

4,984,377
ALL CONDITION FISHING WADERS

Gottlieb R. Schneider, 4410 N. 13 East, Mountain Home, Id. 83647

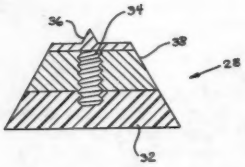
Filed Dec. 11, 1989, Ser. No. 448,536
Int. Cl.[5] A43B *5/00*
U.S. Cl. 36—134 **1 Claim**

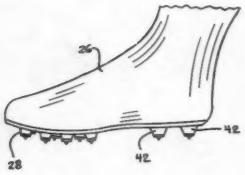
1. A new and improved cleat assembly in combination with waders wherein the waders include a bottom sole portion, the assembly comprises,
cleat means fixedly securable to the bottom sole portion of said waders;
and
a plurality of metallic spike means for selective attachment to said cleat means,
wherein said cleat means include at least one metallic bar member, attached to said sole portion of said waders,
wherein said metallic spike means are threadably attached to said bar member,

wherein a metallic spacer is positioned between said metallic spike means and said bar member, and

wherein said spacer means are of a truncated cone shape, said metallic spike means being threadedly attached to said spacer means, and

including additional traction means for selectively imparting enhanced traction to the spike means,





wherein said additional traction means comprises felt pad means attachable to said sole, and each of the cleat means includes an elastomeric truncated conical base mounted to the bar member underlying coaxially aligned with the spacer, and each of the cleat means includes a spike plate member defining a plate including a projection directed outwardly therefrom, and each plate member including a threaded shank underlying and fixedly mounted to each plate member receivable within the spacer.

4,984,378

LIGHTED EMBROIDERY HOOP APPARATUS

Margaret M. Colman, 14600 Foxmeadow #800, Houston, Tex. 77035

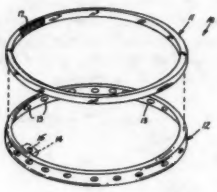
Filed Feb. 26, 1990, Ser. No. 485,034

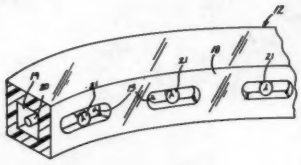
Int. Cl.[5] D05C *1/00, 1/02, 1/04*

U.S. Cl. 38—102.2 **8 Claims**

1. A lighted embroidery hoop apparatus comprising,

an outer hoop ring securable in a surrounding relationship to an inner hoop ring, the inner hoop ring including illumination means mounted therewithin for directing artificial





light to illuminate a fabric mounted on said embroidery hoop.

4,984,379

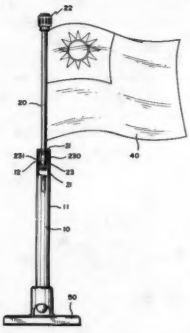
PEN STRUCTURE WITH A FLAG

Victor Lee, 2F., No. 30, Lane 89, Wen Sheng Street, Panchiao City, Taipei Hsien, Taiwan

Filed Jan. 22, 1990, Ser. No. 468,145

Int. Cl.[5] G09F *19/06*

U.S. Cl. 40—334 **5 Claims**



1. A writing instrument having means to display a flag or the like comprising:

(a) an external pen holder having generally hollow cylindrical shape and defining an elongated opening extending along less than the length of the external pen holder, through a wall of the external pen holder, the elongated opening having a bottom;

(b) an internal pen holder axially slidably and rotatably received in the external pen holder having a generally hollow cylindrical shape, the internal pen holder defining a slot extending completely along its length such that the internal pen holder has a generally "C" shaped cross-sectional configuration;

(c) an obstruction hole defined by the external pen holder near an upper end thereof;

(d) a positioning block fixedly attached to a lower portion of the internal pen holder, the positioning block having a projecting edge extending into the elongated opening in the external pen holder and a flexible tenon extending from a side thereof such that relative axial sliding movement between the internal and external pen holders is limited in a first direction by contact between the projecting edge of the positioning block and the bottom of the elongated opening and in an opposite direction by engagement of the obstruction hole and the flexible tenon; and,

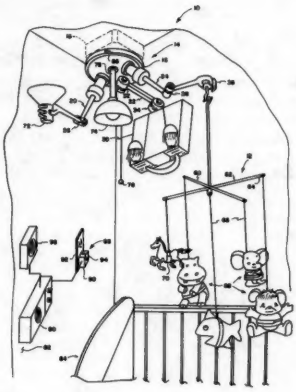
(e) means attached to the internal pen holder to deform its cross-sectional shape so as to close the slot such that an edge of the flag or the like is clamped onto the internal pen holder.

4,984,380

BODY-MOTION ACTIVATED CRIB MOBILE

Rodney D. Anderson, 1760 Carson La., Huntsville, Ala. 35816

Filed Jul. 17, 1989, Ser. No. 380,604
Int. Cl.[5] G09F *27/00*; A63H *30/00*
U.S. Cl. 40—455 **13 Claims**



1. A mobile system comprising:

a mobile adapted to be rotated in proximity to a structure holding an infant and in view of the infant;

an electric motor;

drive means operably coupling said motor to said mobile;

means for activating said motor in response to motion of the infant above a predetermined level comprising a passive infrared sensor adapted to provide a signal upon sensing such motion and switching means responsive to said signal and coupled to said motor;

means for connecting said motor and said activating means to a power supply; and

means for supporting said mobile;

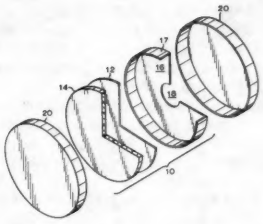
said system being adapted to enable said infant to deliberately control switching of said motor by increasing or decreasing his or her body motion.

4,984,381

FIREARM WEAR ANALYSIS

William W. Seifert, Wellesley Hills, Mass., assignor to Institute Guilfoyle, Belmont, Mass.

Filed Mar. 17, 1989, Ser. No. 325,296
Int. Cl.[5] F41C *31/04*
U.S. Cl. 42—1.01 **19 Claims**



1. An apparatus for collecting debris emitted from a firearm, comprising:

A. a receptacle, formed of a material sufficiently ductile so that it is easily penetrated when a projectile is fired into the apparatus; and

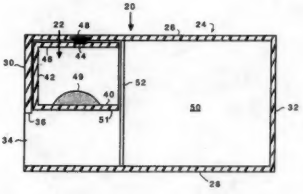
B. a collecting medium, disposed on a surface of the receptacle, the collecting medium a material capable of trapping the particles exhausted from the firearm, and maintaining the particles in a matrix.

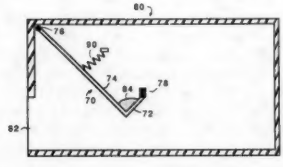
4,984,382

TRAP ACTUATED BY AN ANIMAL'S WEIGHT

Christopher Yost, #2, 273 Lakeshore Rd., E. Mississauga, Ontario, Canada L5G 1G8

Filed Feb. 24, 1989, Ser. No. 315,281
Claims priority, application Canada, Oct. 21, 1988, 581088
Int. Cl.[5] A01M *23/02*
U.S. Cl. 43—61 **15 Claims**





1. An animal trap, for catching animals in an unharmed manner, comprising:

a cage having a top, a bottom, a pair of side walls, a first end wall, and a second end wall;

an opening in said cage;

a door means located in said first end wall;

a platform adapted to receive and retain bait used to attract animals and also adapted to receive at least a portion of the body of an animal to be trapped, said platform having a set position and an actuated position;

retaining means for retaining said platform in said set position;

wherein said retaining means releases the platform upon introduction of at least a portion of the weight of said animals, whereby said platform is moved from said set position to said actuated position upon being released;

wherein said door means has a set position and an actuated position, with said door means being in said set position when said platform is in said set position;

wherein upon the actuation of said platform, the position of said door means is contingent upon the position of said platform;

wherein said opening is substantially obstructed by said door means in said actuated position,

wherein said door means is returned to said set position, after the said cage is turned upside down so as to rest said cage onto its top; and

wherein said door is returned to said set position with said retaining means.

4,984,383

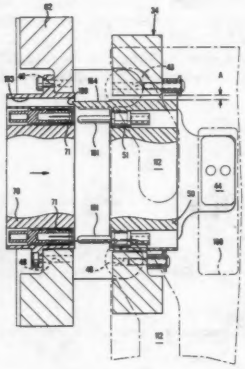
DUAL ACTION OPERATING MECHANISM FOR A PLUGBOARD SYSTEM

Dale B. Mummey, Camp Hill, and Brent D. Yohn, Newport, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 16, 1990, Ser. No. 494,560

Int. Cl.[5] H01R *13/15*

U.S. Cl. 439—259 **30 Claims**



1. A dual action operating mechanism for a plugboard system or the like to connect and disconnect electrical terminal modules of a front bay with respective electrical terminal modules of a rear bay, comprising:

a rear bay including a frame having top, bottom and side members in which a subframe is mounted to move in a normal direction, said subframe having a plurality of first and second electrical terminal modules each containing first and second terminals respectively, and a coupler mounted on said subframe;

hanger plates mounted onto opposite side members of said rear bay frame in alignment with each other and including guide slots therein, said hanger plates serving to receive in said guide slots thereof support members extending outwardly from respective side members of a frame of a front bay;

sliding cam plates mounted on said rear bay frame and movable along said hanger plates, each cam plate having a front cam surface formed to move said front bay via said support members in a straight inward direction;

each of said cam plates having a first actuator surface, and a second actuator surface which is engageable with said subframe coupler;

an operating member mounted onto said rear bay frame to move said cam plates in unison relative to said hanger plates between an inoperative position, an intermediate position, and an operative position, said operating member including a cam having a bearing means thereon disposed to engage said first actuator surface of said sliding cam plates;

said bearing means movable when said operating member moves said sliding cam plates between said inoperative and intermediate positions in a single motion, so that said support members are positioned in said respective guide slots, said hanger plates are moved into said front cam surface, said sliding cam plates move along said side members of said rear bay frame causing said support members to move along said guide slots in a straight inward direction thereby electrically connecting together ones of said first electrical terminals of said rear bay and associated first terminals in first modules of said front bay and simultaneously moving contact sections of said second rear bay terminals to coextend along corresponding contact sections of associated second terminals in second modules of said front bay; and

continued movement of said operating member from said intermediate to said operative position causes said second actuator surface of said sliding cam plate to move said subframe in the normal direction to engage together and electrically connect with preselected contact force said coextending contact sections of said second front and rear bay terminals.

4,984,384

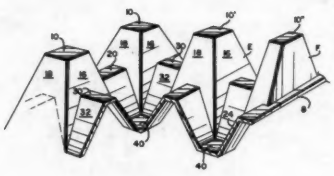
BIO-DEGRADABLE MULCHING MATERIAL

David A. Kaufmann, Gambrills, Md., assignor to Kaufmann, Bryan Environmental Concepts, Inc., Gambrills, Md.

Continuation of Ser. No. 30,025, Mar. 25, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 441,347

Int. Cl.[5] A01G *7/00*; E02B *3/04, 3/12*

U.S. Cl. 47—9 **28 Claims**



1. A method of recovering and revegetating shorelines subjected to waves of low to moderate energy comprising the steps of:

(a) providing a plurality of relatively thin, solid sheets of biodegradable material provided with coating means for delaying biodegradation, each sheet of which has an upper and lower surface, and a pattern of projections and depressions which extend above and below, respectively, intermediate flat surfaces of said sheet, said pattern being interrupted by a plurality of plant-receiving apertures formed therein in accordance with predetermined plant density requirements;

(b) securing said plurality of sheets in edge overlapping relationship to the shoreline area to be recovered; and

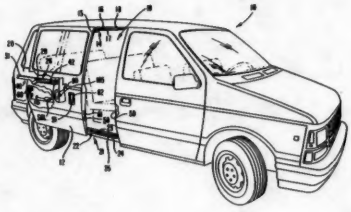
(c) installing plants in the ground beneath said apertures so that said projections and depressions serve to dissipate wave energy and to collect sediment to thereby prevent washout of said plants.

4,984,385

POWERED CLOSING ASSIST MECHANISM FOR VEHICLE DOORS OR LID MEMBERS

Daniel L. DeLand, Davison, Mich., assignor to Masco Industries, Inc., Taylor, Mich.

Filed Mar. 22, 1990, Ser. No. 497,504
Int. Cl.[5] E05F *15/00*
U.S. Cl. 49—280 15 Claims



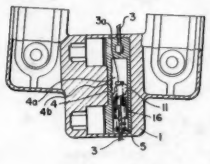
11. A door operator system for a door that is slidingly supported relative to a door opening in a panel of a vehicle body, said door being supported adjacent a forward end on at least one forward guide member and being supported adjacent a rear end on a rear guide member, said guide members guiding said door through an initial closing movement and a final opening movement generally parallel to said panel, said guide members guiding said door through at least a portion of its initial opening movement generally away from the plane of said door opening, and said guide members guiding said door through at least a portion of its final closing movement generally toward the plane of said door opening, said door operator comprising a first cable having one end coupled to the rear end of said door and a second cable having one end coupled to the forward end of said door for driving said door along said guide members to thereby move said door through said initial and final opening and closing movements, each of said cables being supported substantially entirely within the interior of the vehicle body when the door is fully closed, said door operator system further including an improved final closing device for selectively clamping and unclamping said door into and from, respectively, a final closed position, said final closing device including a rotatable member, an actuating member interconnected with said rotatable member for movement between a clamping position and an unclamping position in response to rotation of said rotatable member, closing device drive means for selectively rotating and stopping said rotatable member, a magnetically actuable switch for controlling the actuation and de-actuation of said closing device drive means, said switch being biased toward one of either its open or closed positions, a plunger having a magnet thereon and being movable between a first plunger position in sufficiently close magnetic proximity with said switch for magnetically actuating said switch to move to the other of its open or closed positions and a second plunger position spaced sufficiently magnetically away from said switch for allowing said switch to move to said one of its open or closed positions, said plunger being biased toward said second position, said rotatable member having first and second surfaces thereon engageable with said plunger, said first surface urging said plunger into said first plunger position when said rotatable member is in a predetermined first rotational position, and said second surface allowing said plunger to return to its biased second position when said rotatable member is in a predetermined second rotational position, whereby said closing device drive means is actuated or de-actuated, and thus said door is in its clamped or unclamped position, in response to the rotational position of said rotatable member.

4,984,386

TENSIONING DEVICE FOR CABLE WINDOW LIFTER

Klaus Marscholl, Ehringshausen, and Thomas Medebach, Wetzlar, both of Fed. Rep. of Germany, assignors to Kuester & Co., Ehringshausen, Fed. Rep. of Germany

Division of Ser. No. 400,546, Aug. 31, 1989, Pat. No. 4,941,286.
This application Apr. 25, 1990, Ser. No. 514,305
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1988, 3829680
Int. Cl.[5] E05F *11/48*
U.S. Cl. 49—352 1 Claim



1. A cable actuated window lifter, comprising:
an actuating drum mounted in the body of a vehicle,
a window drive bracket mounted for vertical adjustment in said vehicle body,
a cable actuated by said drum with a first end solidly joined to said drive and having a second end
a tensioning device defined by a directional lock mounted on said drive bracket and connected to said second end, and
said directional lock comprising:
a cogged rack,
a part displaceable relative to said rack having cog means for engaging said rack and articulated on said second end,
a compression spring surrounding said cable and located between said bracket and said displaceable part for compensation of cable elongation, said first compression spring always stressing said displaceable part with said second cable end articulating on it in the direction of cable tautening relative to said drive bracket, and
said displaceable part is a molded part unilaterally engaging said cogged rack and tipping relative to said cogged rack during cable elongation under stress from said compression spring first in the direction of cable tautening and only upon further cable elongation slipping out of said cogged rack and into a further cog.

4,984,387

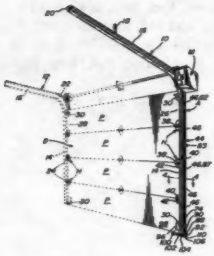
DOOR DRIVE MECHANISM ADAPTER UNIT

Graham Wheatland, Pointe-Claire, Canada, assignor to 501 Manaras Auto Doors, Inc., Aurent, Canada

Filed Jun. 8, 1989, Ser. No. 363,623
Int. Cl.[5] E05F *11/34*
U.S. Cl. 49—362 19 Claims

1. An adapter unit for mechanically driven doors of the type such as garage doors driven by a motor and guided at sides thereof by guide rails mounted at least to a frame defining a door opening, comprising a body defining an elongated channel means, a drive means including a push-pull flexible elongated drive member slidably engaged in said channel means for longitudinal movement therein while being by said body to prevent lateral deflection of said member therein restrained, said drive means being coupled and driven by the motor and being connected to the door for the driving thereof between

open and closed positions thereof, whereby upon actuation of the motor, said flexible elongated drive member is displaced in



said channel means thereby forcing a movement of the door in a direction dependent on that of the motor.

4,984,388

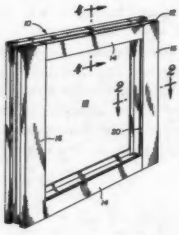
CLOSURE UNIT

Terry S. Johnson, 9395 Glider Loop, Colorado Springs, Colo. 80908

Continuation of Ser. No. 154,645, Feb. 9, 1988, abandoned, which is a division of Ser. No. 878,298, Jun. 25, 1986, Pat. No. 4,724,597. This application Sep. 11, 1989, Ser. No. 406,874

Int. Cl.[5] E06B *3/00*

U.S. Cl. 49—501 **12 Claims**



1. In a closure unit of the type having a sash member with central glazing area, wherein one side of the sash member is designated as the exterior face and the opposite side is designated as the interior face, the central glazing area is bounded by an inner perimetric face of the sash member, and the sash member also is bounded by an outer perimetric face, the improved construction of the sash member comprising:

a cellulosic core;

an outer coating of synthetic plastic material attached to said core and covering substantial portions thereof from external exposure; and

a metal cladding substantially entirely defining the exterior face of said sash member to protect said synthetic coating from ultraviolet degradation;

wherein the coating of synthetic plastic material forms a unitary structure with the cellulosic core and metal cladding.

4,984,389

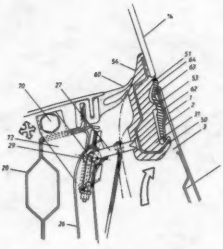
AUTOMOBILE DOOR WITH FLUSH MOUNTED GLASS

Dominque Benoit, Aurora, and Jonathan Vinden, Mississauga, both of Canada, assignors to Atoma International, A Magna International Company, Newmarket, Canada

Filed May 2, 1989, Ser. No. 346,628

Int. Cl.[5] B60J *5/04*

U.S. Cl. 49—502 **12 Claims**



1. An automobile door adapted to be mounted in a door frame of an automobile body, said door comprising:

a door shell, comprising:

an outer panel,

a hinge member and a latch member, and

an outer belt reinforcing means attached inside the outer panel;

an inner belt reinforcement means lying parallel to the door between the hinge member and the latch member of the door shell;

a window fitting flush to the door frame and the centre panel;

window sealing means lying between the window and adjacent parts of the door frame and the outer panel;

a window drive means for moving the window;

a window guide means for guiding the window throughout its motion;

gripping means on the window releaseably interacting with the outer belt reinforcement member to stop and locate a bottom edge of the window flush to the outer panel; and

adjustment means permitting adjustment of an upper edge of the window to be located flush to the door frame;

wherein the module is fastened to the door structure by first fastening means located in the inner belt reinforcement means and by second fastening means disposed on the module at a location lower than the first fastening means, said second fastening means and the adjustment means permitting the module to be rotatably adjusted about a horizontal axis parallel to the door proximate to the inner belt reinforcement means to permit the upper edge of the window to be positioned flush to the door frame.

4,984,390

GRINDING DISC DRESSING APPARATUS

Shigeo Kobayashi, Kanagawa, Japan, assignor to Nippei Toyama Corporation, Tokyo, Japan

Filed Nov. 9, 1989, Ser. No. 433,870

Int. Cl.[5] B24B *53/00*

U.S. Cl. 51—5 D **16 Claims**

4. A grinding disc dressing apparatus for dressing a grinding disc of a surfece grinding machine, comprising:

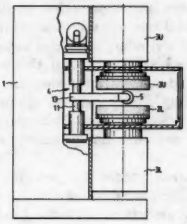
(a) a main shaft extending parallel to the axis of rotation of said grinding disc;

(b) means for angularly moving said main shaft about an axis thereof;

(c) an arm fixedly mounted on said main shaft at a proximal end thereof, said arm being disposed radially outwardly of

an outer periphery of said grinding disc, so that said arm is angularly movable together with said main shaft, said arm having a distal end movable along an active grinding surface of said grinding disc;

(d) a rotary dressing roll mounted on the distal end of said



arm, said dressing roll having an axis or rotation disposed in the direction of movement of said distal end of said arm, said dressing roll acting on said active grinding surface to dress the same; and

(e) means for rotating said dressing roll about its axis of rotation to dress said grinding disc.

4,984,391

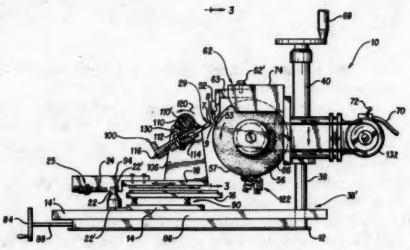
MACHINE FOR FORMING WOODWORKING TOOL

Kenneth G. Sattler, 2839 SW. Sunset Trail, Palm City, Fla. 34990

Continuation-in-part of Ser. No. 207,338, Jun. 15, 1988, abandoned. This application Mar. 15, 1990, Ser. No. 493,798

Int. Cl.[5] B24B *7/00*

U.S. Cl. 51—100 R **4 Claims**



1. A grinding machine, including:

grinding wheel support means, said support means for housing a rotatable grinding wheel with a leading edge driven by a drive means, and further including an adjustable guide means secured to said grinding wheel support, said guide means positioned adjacent said grinding wheel to place a knife blank in correct alignment with said grinding wheel, said adjustable guide means being pivotably mounted about a pivot point in relation to said grinding wheel and having a solitary point disposed over the leading edge of said grinding wheel that remains stationary as said adjustable guide means pivots, said solitary point being a center of rotation;

at least one movable table disposed below said grinding wheel support means and including a tool holding means adjustably connected to said movable table;

said tool holding table movable, including full two dimensional planar movement, with respect to said grinding wheel and operably positioned for grinding a knife secured within said tool holding means, said tool holding means further including an adjustable template holding means;

a template guide means positionable in a fixed operational relationship with respect to said grinding wheel;

said template holding means operably positioned adjacent said template guide means for engagement with said template guide means;

said tool holding means positioned in front of said grinding wheel for securing a knife face-up for engagement with said grinding wheel, said tool holding means and said grinding wheel positioned to first engage an upper leading edge of said knife face prior to said grinding wheel completing its operation, said grinding wheel grinding into the said knife leading edge, said tool holding means having a rotating upper section that contains said knife, said rotating section rotating relative to an axis parallel to an axis of movement of said movable table and normal to a longitudinal axis of said grinding wheel support means;

a pivot point for rotating said grinding wheel support means about an axis parallel to an axis of movement of said movable table and normal to the axis of rotation of said grinding wheel and disposed through said solitary point, said pivot means enabling said grinding machine to provide for clearance when operating upon said knife blank; wherein said solitary point is the pivot point for the adjustable guide means and the pivot point for the grinding wheel support means;

wherein said upward facing knife and said template are viewed by the operator in exact orientation as on a woodworking machine, thus no mirror image movements interfere with the operator as he forms his desired pattern; and

wherein said grinding machine grinds knife edges which have face angles in a straight on fashion, thereby providing a blade orientated during the grinding process as actually utilized when subsequently cutting a wood object.

4,984,392

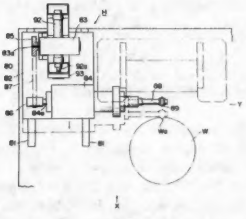
CHAMFERING THE NOTCH OF A SEMICONDUCTOR WAFER

Toshio Sekigawa, and Kenichi Yoshihara, both of Niigata, Japan, assignors to Shin-Etsu Handotai Company Limited, Tokyo, Japan

Division of Ser. No. 255,161, Sep. 29, 1988, Pat. No. 4,905,425. This application Sep. 27, 1989, Ser. No. 413,406

Int. Cl.[5] B24B *49/00*

U.S. Cl. 51—165.77 **3 Claims**



1. An apparatus for chamfering the notch of a notch-cut semiconductor wafer comprising a positioning means for positioning the semiconductor wafer in a manner that the notch provided in the periphery of the semiconductor wafer points in a predetermined direction; a conveyor means for conveying the thus positioned semiconductor wafer to a chamfering position; a holding means for holding the semiconductor wafer in the chamfering position to bring the wafer to arbitrary places; an abrasive wheel having a swelling edge which is shaped like the notch when seen in a cross section taken on a plane containing the axis of rotation of the abrasive wheel; a driving means for driving the abrasive wheel; and a means for controllingly

moving at least one of the two items consisting of the abrasive wheel and the semiconductor wafer, to arbitrary places.

4,984,393

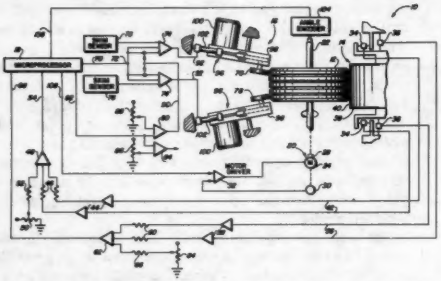
METHOD FOR TIRE UNIFORMITY CORRECTION

Clarence L. Rogers, Jr., Hartville, Ohio, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Continuation of Ser. No. 322,870, Mar. 14, 1989, abandoned, which is a division of Ser. No. 68,687, Jul. 1, 1987, Pat. No. 4,837,980. This application Feb. 15, 1990, Ser. No. 481,795

Int. Cl.[5] B24B *49/00*

U.S. Cl. 51—165 R 26 Claims



1. A method of processing a tire, said method comprising the steps of:

rotating the tire at a speed of at least 100 revolutions per minute;

sensing force variations generated by the rotating tire;

producing frequency modified electrical signals in response to the sensed force variations;

processing the electrical signals in a summer amplifier so the electrical signals correlate closely to electrical signals which would be produced in response to force variations sensed at an industry standard speed for tire rotation of 60 revolutions per minute by receiving the electrical signals, by filtering such electrical signals at a frequency higher than the industry standard frequency of 60 cycles per minute and by generating a digital signal indicative of the force variations;

processing the digital signal in a microprocessor by interpreting the digital signal and by storing the interpreted digital signal; and

utilizing such stored signal to program the rotating of the tire and the removing of rubber from the rotating tire.

4,984,394

METHOD AND APPARATUS FOR GRINDING STRAIGHT-EDGED CUTTING TOOLS TO A FINE FINISH

Hironi Suzuki, Oobu; Eiiti Suzuki, Toyoake, and Isao Mizuno, Nagoya, all of Japan, assignors to 501 Kirin Beer Kabushikikaisha, Tokyo, Japan

Division of Ser. No. 83,732, Aug. 10, 1987, Pat. No. 4,845,900. This application Apr. 21, 1989, Ser. No. 342,460

Claims priority, application Japan, Dec. 25, 1986, 61-313134; Dec. 27, 1986, 61-315747

Int. Cl.[5] B24B *3/38, 9/04*

U.S. Cl. 51—165.9 24 Claims

1. Apparatus for grinding an elongate, straight-edged cutting tool to a fine finish, comprising:

(a) frame means for forming a framework of the apparatus;

(b) means on the frame means for immovably holding a work in a prescribed attitude;

(c) a grinder carriage mounted on the frame means for reciprocating movement in a longitudinal direction of the work;

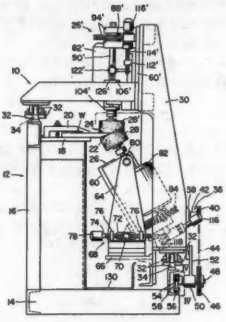
(d) a grinding wheel mounted on the grinder carriage both for rotation about its own axis and for axial movement toward and away from the work in a direction at right angles with the longitudinal direction of the work, the grinding wheel being further capable of moving with the grinder carriage between a pair of opposite ends of the longitudinal dimension of the work;

(e) wheel drive means on the grinder carriage for imparting rotation to the grinding wheel;

(f) energy storage means provided on the grinder carriage for storing fluid energy, said storage means comprising a fluid-actuated cylinder, and feed means for moving the grinding wheel axially toward the work via the fluid-actuated cylinder, the feed means being capable of pressing the grinding wheel endwise against the work via the fluid-actuated cylinder until fluid energy builds up in the cylinder for enabling the grinding wheel to grind the work;

(g) carriage drive means for reciprocably moving the grinder carriage longitudinally of the work;

(h) valve means associated with the fluid-actuated cylinder for relieving the grinding wheel of the fluid energy each time the grinding wheel reaches either end of the work,



until the grinding wheel restarts traveling toward the other end of the work;

(i) angle adjustment means on the grinder carriage for adjustably varying the angle of the axis of the grinding wheel with respect to the work about an axis parallel to the longitudinal direction of the work;

(j) angle detector means for detecting the angle of the grinding wheel with respect to the work;

(k) grinding depth detector means for detecting the depth to which the work has been ground by the grinding wheel; and

(l) control means electrically connected to the angle detector means and the grinding depth detector means for inputting data representative of the angle of the grinding wheel with respect to the work and of the depth to which the work has been ground by the grinding wheel, the control means being further electrically connected to the wheel drive means and the carriage drive means and the angle adjustment means for controlling their operations in accordance with the input data.

4,984,395

GRINDING DEVICE AND METHOD FOR GRINDING CARD CLOTHING

Robert Demuth, Nurensdorf, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Dec. 16, 1988, Ser. No. 285,122

Claims priority, application Switzerland, Dec. 24, 1987, 05056/87

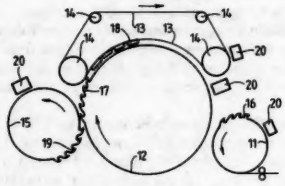
Int. Cl.[5] B24B *19/18*

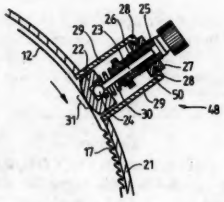
U.S. Cl. 51—242 23 Claims

1. A grinding device for the clothing of a carding machine element, said device comprising

a support;

at least one grinding member for grinding the teeth of a carding machine element, said member being mounted on said support with three degrees of freedom of movement; and





means elastically biasing said grinding member outwardly of said support to engage the teeth of a carding machine element.

4,984,396

CLEANING DEVICE

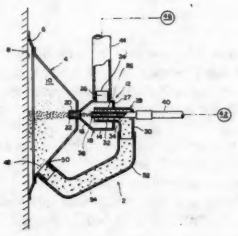
Fukashi Urakami, Maruyoshi Bldg. 608, 17-24, Konandai 4-chome, Konan-ku, Yokohama, Japan

Filed Aug. 22, 1989, Ser. No. 396,967

Claims priority, application Japan, Aug. 29, 1988, 63-214536

Int. Cl.[5] B24C 9/00

U.S. Cl. 51—424 **5 Claims**



1. A cleaning device comprising:

a cleaning head having a first nozzle flow passage with an associated cross-sectional area, to be positioned opposite to a surface to be cleaned, a second nozzle flow passage with an associated cross-sectional area, spaced upstream of the first nozzle flow passage, a re-impinged cleaning material inflow passage and an outflow passage,

means for feeding a pressure fluid stream containing a cleaning material to the second nozzle flow passage,

means for sucking a fluid from the outflow passage, and

means for returning the cleaning material impinged against said surface from the first nozzle flow passage to the re-impinged cleaning material inflow passage:

whereby the pressure fluid stream containing the cleaning material which has been fed to the second nozzle flow passage from said cleaning material feed means passes through the second nozzle flow passage, advances into the first nozzle flow passage and is impinged against said surface from the first nozzle passage;

said cross-sectional area of the first nozzle flow passage being sufficiently larger than that of the second nozzle whereby the flowing of the pressure containing the cleaning material creates a sucking action in the first nozzle flow passage, and a portion of the cleaning material returned to the re-impinged cleaning material inflow passage is sucked into the first nozzle flow passage by the sucking action, and re-impinged against said surface from the first nozzle flow passage while a portion of the remainder of the cleaning material returned to the re-impinged cleaning material inflow passage is entrained by the fluid sucked from the outflow passage.

4,984,397

ABRASIVE BLASTING APPARATUS

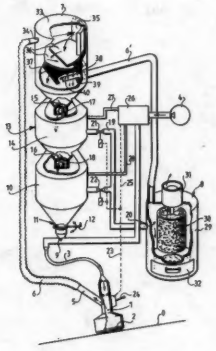
Jacob K. L. Van Leeuwen, Oosterhout, Netherlands, assignor to LTC International B.V., Oosterhout, Netherlands

Continuation of Ser. No. 131,382, Dec. 9, 1987, abandoned. This application May 2, 1989, Ser. No. 348,174

Claims priority, application Netherlands, Dec. 9, 1986, 8603134

Int. Cl.[5] B24C 7/00

U.S. Cl. 51—425 **8 Claims**



1. An abrasive blasting apparatus comprising the combination of a blasting nozzle including operator-controlled switching means for periodically controlling the apparatus, a grit supply hopper, a hopper for separating grit and dust and a grit tranfer hopper, all disposed in a stack with the hopper for separating grit and dust uppermost, the grit supply hopper lowermost and the grit transfer hopper in intermediate position, the lower end the grit supply hopper being in communication with the nozzle, a dust collector comprising a housing containing air-withdrawal means for maintaining the interior of the housing under partial vacuum, a dust discharge conduit leading from the hopper for separating grit and dust to the dust collector, bleed conduit means for connecting the interior of the dust collector housing to the interiors of the grit supply hopper and the grit transfer hopper, the bleed conduit means including controlled valve means for simultaneously opening and closing the connections to the interiors of the grit transfer hopper and the grit supply hopper, first valve means connecting the grit transfer hopper to the grit supply hopper for selectively dumping grit from the grit transfer hopper to the grit supply hopper when the interiors of such hoppers are connected to the interior of said dust collector housing and pre-

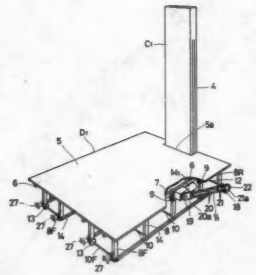
venting flow of grit from the grit transfer hopper to the grit supply hopper when the interiors of such hoppers are connected to a compressed air source, second valve means connecting the hopper for separating grit and dust to the grit transfer hopper for selectively dumping grit from the hopper for separating grit and dust into the grit transfer hopper when the interior of the grit transfer hopper is connected to the interior of the dust collector housing, a compressed air source, a control unit controlled by the switching means and connected to the compressed air source, the grit supply hopper and the grit transfer hopper, said controlled valve means also being controlled by said switching means so that operation of said switching means selectively controls the controlled valve means to closed condition while compressed air is supplied simultaneously to the nozzle, the interior of the grit supply hopper and the interior of the grit transfer hopper and operation of said switching means disconnects the source from the nozzle, the interior of the grit supply hopper and the interior of the grit transfer hopper while the controlled valve means is actuated to open condition, and a grit and dust return conduit extending from the nozzle to the interior of the hopper for separating grit and dust.

4,984,398

FOLDING STAGE UNIT

Kazuo Fujita, No. 1, Hagiyamadai 1-chome, Seto, Aichi, Japan

Division of Ser. No. 315,847, Feb. 27, 1989, Pat. No. 4,939,875.
This application Apr. 5, 1990, Ser. No. 505,186
Claims priority, application Japan, Aug. 27, 1988, 63-213417
Int. Cl.[5] E04H *3/26*
U.S. Cl. 52—7 **2 Claims**



1. A folding stage unit comprising

(a) a guide post fixed to an indoor or outdoor support wall structure and having

(i) an inner space generally divided into an inner chamber and outer chambers,

(ii) vertical grooves provided in opposed side walls of the guide post which make said outer chambers communicate with the outside of the guide post,

(iii) a pair of vertically-movable support means provided in said outer chambers, respectively,

(iv) a vertically-movable balancer provided in said inner chamber, and

(v) means provided in said inner space for connecting said support means and said balancer for opposite vertical movements

(b) a stage proper including

(i) a platform,

(ii) a platform supporting structure with plural support legs which are pivotally connected to a bottom of said platform, and

(iii) wheels provided in conjunction with respective foremost ones of said support legs to enable a front end portion of the stage proper to move smoothly toward or away from the guide post on a floor,

(c) means for connecting a rear portion of said platform supporting structure to said support means through said grooves so that a rear portion of the stage proper can be moved along the guide post,

(d) a pair of opposed operating mechanisms connected to said platform supporting structure for folding the stage proper from a horizontal position on the floor to a vertical position adjacent to the guide post or unfolding the stage proper from the vertical position to the horizontal position,

(e) each said operating mechanism including (i) a geared motor fixed to said platform supporting structure at a substantial middle of the distance between front and rear ends of the stage proper and having an output shaft rotatable in either of opposed directions and (ii) an extensible swing arm member having one end fixed to said output shaft, and

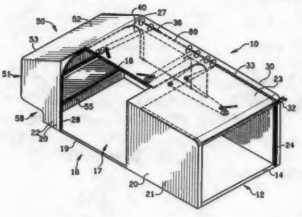
(f) means for pivotally connecting an opposed end of said swing arm member to a portion chosen between a portion of the floor which is in close proximity to said support wall structure and a lower end portion on said support wall structure.

4,984,399

AUTOMOBILE ENCLOSURE

Gary L. Taylor, 715 S. Upas St., Escondido, Calif. 92025

Filed Jun. 25, 1990, Ser. No. 542,757
Int. Cl.[5] E04B *7/16, 1/346;* E04H *6/00*
U.S. Cl. 52—64 **21 Claims**



19. An automobile housing of low height providing improved access for a person whose height is greater than the roof of the housing; said housing comprising:

an enclosure for surrounding an automobile on five sides including:

a pair of spaced opposed upright side walls including:

a driver side wall; and

a passenger side wall; and

a roof joining said side walls; said side walls and said roof being substantially inverted U-shaped in cross section and defining a rear opening dimensioned for accepting an automobile an an opposite front end; said driver side wall and roof having a side access opening extending therethrough for providing free and normal standing access to an enclosed automobile driver door;

a front end closure joining said said roof at the front end of said enclosure;

a roll-up side door mounted in a side door guide means and moveable between a closed position closing said side access opening and an open position opening said side access opening and providing free and normal standing access to an enclosed automobile driver door; and

a roll-up rear door mounted in a rear door guide means and moveable between a closed position closing said rear opening and an open position opening said rear opening for accepting an automobile;

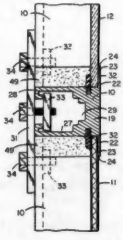
side door guide means mounted to said enclosure adjacent the sides of said side access opening and crossing under said roof for providing a path of travel for said side door;
rear door guide means mounted to said enclosure adjacent the sides of said rear door and proceeding forward under said roof for providing a path of travel for said rear door;
side door opening, closing and locking means for opening and closing said side door and for locking said side door in the closed position comprising:
a side door shaft rotatably mounted in said enclosure;
side door opening winch means for opening said side door comprising:
a side door opening cable including:
a first end connected to said side door; and
a second end:
a side door opening cable drum mounted on said side door shaft and retaining said side door opening cable second end and rotatable with said side door shaft such that winding said side door opening cable onto said side door opening drum opens said side door;
side door locking winch means within said enclosure including:
a side door locking cable having a first end connected to said side door and a second end; and
a side door locking drum mounted on said side door shaft and retaining said side door locking cable second end wound counter to said side door opening drum cable such that said side door locking cable must be unwound from said side door locking drum for s id side door to open and being
a rotatable with said shaft such that unwinding permits said side door to be opened;
rear door locking means for locking said rear door in the closed position;
rear door opening means connected to said rear door for moving said rear door from the closed position to the open position; and
linking means linking said rear door opening means with said side door opening, closing and locking means such that opening said rear door opens said side door and closing said rear door closes said side door.

4,984,400

CLEAN ROOM CHANNEL WALL SYSTEM

Douglas F. Bockmiller, 914 Aquarius Way, Oakland, Calif. 94611

Filed Nov. 13, 1989, Ser. No. 434,175
Int. Cl.[5] E04H *1/00*
U.S. Cl. 52—241 **11 Claims**



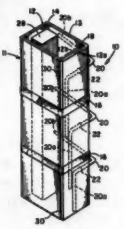
1. A framing member for supporting at least one wall panel comprising:
An elongated body having a straight front seamless face surface and having a pair of legs opposed to one another and perpendicular to said front seamless face surface;
at least one elongated panel support flange having an elongated edge joined to said elongated body thereby forming said front seamless face surface of said framing member which includes said front seamless face surface of said body contiguous with front surfaces of said flanges;
at least one elongated glazing spline normal to said leg and in close proximity to a rear surface of said panel support flange,
said leg having an elongated receptor groove parallel to and operably positioned at a distance from a backsurface of said flange to securely engage said spline and permit a panel butt surface to be secured between said flange and said spline.

4,984,401

DEVICE AND METHOD FOR HOUSING A STEEL REINFORCEMENT IN AN AREA WHERE JOINTS ARE MADE BETWEEN FIRST AND SUBSEQUENTLY POURED CONCRETE STRUCTURES

Michael Baldino, Omaha, Nebr., assignor to Dayton Superior Corporation, Miamisburg, Ohio

Filed Jul. 31, 1989, Ser. No. 387,684
Int. Cl.[5] E04G *15/04*
U.S. Cl. 52—378 **11 Claims**



1. A device for housing a steel reinforcement in an area where joints are made between first and subsequently poured concrete structures, said device comprising:
a single sheet of material having a first end portion and an opposed second end portion, said single sheet of material being folded such that said first end portion and said second end portion are in facing overlapping engagement to thereby form a housing of generally tubular cross section;
securing means for holding said single sheet of material in said folded position with said first and second end portions in facing overlapping engagement for preventing liquefied concrete from entering the housing and for allowing quick access to the interior of said housing by severing said securing means and unfolding said single sheet of material; and
at least one steel reinforcement bar having a first portion thereof positioned within said housing for being embedded in said subsequently poured concrete structure and a second portion thereof extending out of said housing through an aperture in said single sheet of material for being embedded in said first poured concrete structure, said at least one steel reinforcement bar being completely supported within said housing by said single sheet of material.

4,984,402

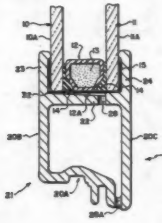
SASH WINDOW ARRANGEMENT

Lawrence W. Davies, Winnipeg, Canada, assignor to Omniglass Ltd., Winnipeg, Canada

Filed Sep. 29, 1989, Ser. No. 414,008
Int. Cl.[5] E04B *1/66, 1/70*
U.S. Cl. 52—398 **7 Claims**

1. A sash window comprising: window frame profile and a sealed window unit, the sealed window unit comprising two panes of glass and spacer means holding the panes in spaced

parallel relationship, said spacer means including means preventing an entry of air into the space between the panes; the unit having at least one side edge, an inner face for facing inwardly into a building and an outer face for facing outwardly of the building to an exterior; the profile extending along said one side edge of the window unit so as to provide support thereof and comprising an integral unitary body defining, in cross section, a channel portion and a closed hollow support element for the channel portion; the channel portion having a first transverse web against which said one side edge of the window unit contacts and a first and a second side wall each upstanding from the first transverse web and contacting and confining respectively said outer and inner faces of the window unit adjacent said side edge; the support element being defined by said transverse web, an inner wall, an outer wall and



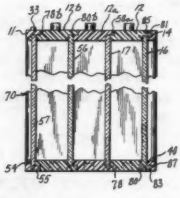
a second transverse web substantially parallel to the first transverse web; the profile being manufactured from material such that the coefficient of thermal expansion of the profile in a longitudinal direction is substantially equal to that of glass; means for sealing the window unit in the channel portion against passage of air therebetween consisting solely of a bead of flexible sealant material in a corner of the channel portion between the second side wall contacting the inner face of the window unit and the first transverse web; said outer face of the window unit being directly in contact with the respective side so that the outer face of the window unit is free from exposed sealant material; means in the first transverse web defining at least one drainage opening for escape of water into the hollow support element; and means in the second transverse web of said hollow support element defining a drainage opening for escape of water therefrom.

4,984,403

MODULAR BUILDING BLOCK

Daniel W. Zarwell, 1296 N. 64th St., Wauwatosa, Wis. 53213

Filed Oct. 25, 1989, Ser. No. 426,920
Int. Cl.[5] E06B *3/64*
U.S. Cl. 52—476 **11 Claims**



1. A modular building block comprising:

a first frame member having walls for supporting a first panel member and an inwardly extending surface to prevent passage of said panel member through said first frame member;

a second frame member having a projecting wall member constructed and arranged to fit within said first frame member and hold said first panel between said projecting wall member and said inwardly extending surface, said second frame member including walls for supporting a second panel member and an inwardly extending wall surface to prevent passage of said second panel member through said second frame member;

a third frame member having a projecting wall constructed and arranged to fit within said second frame member and hold said second panel between said projecting wall of said third frame and said inwardly extending surface of said second frame; and

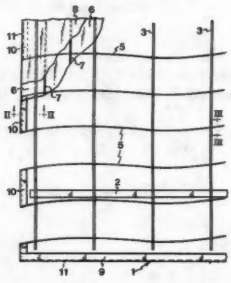
frictional engagement means operatively associated with said frame members to provide frictional engagement between said frame members for holding said frame members in an assembled manner.

4,984,404

RESILIENT FLOOR

Nils Fabricius, Kanotvägen 12, S-282 00 Tyringe, Sweden

Filed Jan. 19, 1990, Ser. No. 467,559
Claims priority, application Sweden, Jan. 20, 1989, 8900197
Int. Cl.[5] E06B *3/54*
U.S. Cl. 52—480 **5 Claims**



1. A resilient floor comprising:

mutually parallel studs whose upper side has recesses extending in the transverse direction and having a bottom which is substantially parallel to the upper side of said studs; and

fillets of substantially rectangular cross-section and mounted in said recesses, said fillets extending beyond the upper side of said studs and supporting surface planks wherein at least one wall of said said recesses is inclined in the longitudinal direction of said studs, the opposite wall of the recess intended for the same fillet and provided in the adjoining stud is inclined in the opposite direction, said fillet is clamped in a wave-like manner in the associated recesses in that it engages the inclined wall, and said recesses are mirror-symmetrically arranged about a center axis transversely of the respective stud.

4,984,405

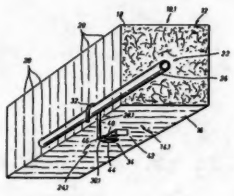
INSULATION AND THE PROVISION THEREOF

Robert A. Sauder, Emporia, Kans., assignor to Thermal Ceramics, Inc., Augusta, Ga.

Continuation of Ser. No. 830,462, Feb. 18, 1986, abandoned, which is a continuation of Ser. No. 752,078, Jul. 3, 1985, abandoned, which is a continuation of Ser. No. 331,673, Dec. 17, 1981, abandoned. This application Oct. 17, 1986, Ser. No. 920,282

Int. Cl.[5] E04B *1/80*

U.S. Cl. 52—506 **43 Claims**



1. An insulation member for use in insulating a furnace surface, the insulation member comprising:

a mat of insulation material, the insulation material being resilient and compressible, the mat having a resilient deformable cold face adapted to engage a furnace surface so that air gaps are minimized when the resilient deformable cold face is compressed against the furnace surface;

attachment means positioned in the mat for attaching the mat to the furnace surface, the attachment means being adapted to be fastened to the furnace surface, the attachment means being operative to generate a distributed bias force through the mat to compress substantially the entire cold face surface against the furnace surface.

4,984,406

BUILDING PANEL

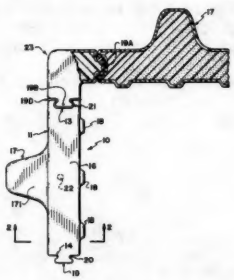
Peter Friesen, R.R. #1, Box 314, Group 24, Winkler, Manitoba, Canada R0G 2X0

Filed Jul. 17, 1989, Ser. No. 297,465

Claims priority, application United Kingdom, Jan. 14, 1988, 880073

Int. Cl.[5] E04B *2/72*; E04C *2/38, 2/20*; E04D *3/32*

U.S. Cl. 52—594 **17 Claims**



1. A building system comprising a plurality of building panels, each building panel comprising a panel body integrally molded by rotational molding from a synthetic plastics material, said panel body having an outer wall substantially wholly enveloping a hollow interior of the panel body and defining a top surface, two side surfaces, a front surface and a rear surface, the panels each having a height sufficient to extend from a floor level to a roof level of a building, the front surface of at least some of the panels including a longitudinal vertical rib projecting outwardly from the front surface to provide structural strength for the panel so that vertical strength of a wall of a building can be provided solely by the panels, each panel having connecting means on the side surfaces thereof for connection to an adjacent side surface of an adjacent panel wherein the rear surface has a plurality of parallel ribs of less height than said rib on the front surface to allow the attachment of a facing material on the rear surface of the panel body.

4,984,407

FRAMEWORK

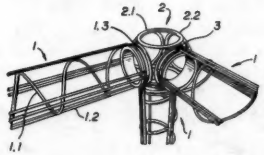
Kurt Ziehmer, Feldstrasse 64, D-4000 Düsseldorf 30, Fed. Rep. of Germany, assignor to Kurt Ziehmer, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 28, 1990, Ser. No. 500,527

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1989, 3910085

Int. Cl.[5] E04H *12/00*

U.S. Cl. 52—648 **13 Claims**



1. A framework comprising:

(a) bearing members, each of which is made of wire, has two ends, and comprises:

(i) a wire spiral;

(ii) a plurality of stiffening wires which extend in a longitudinal direction of said wire spiral, which are arranged about the circumference of said wire spiral, and which are securely fastened to said wire spiral at mutual first contact points, for stiffening and staying said wire spiral; and

(iii) end rings for closing each end of said bearing member;

(b) joint elements for connecting the ends of at least two of said bearing members, each said joint element having substantially the shape of a regular polyhedron and comprising a plurality of wire rings, said wire rings being provided on delimiting surfaces of said polyhedron and contacting each other pairwise on edges of the polyhedron and being mutually and securely joined together at second contact points; and

(c) tensioning rings for connecting each said joint element with the ends of the bearing members, a first end of each said tensioning ring being insertable into the wire rings of the joint element and a second end of each said tensioning ring being insertable into the end rings of the bearing members.

4,984,408

METHOD FOR ARRANGING LINES IN A FLOOR LEVEL TO BE DIVIDED UP INTO SMALLER ROOMS AND ELEMENTS SUITABLE FOR THIS METHOD

Nicolaas J. Habraken, Cambridge, Mass.; Age Van Randen, Rotterdam, Netherlands; Franciscus De Vries, Delft, Netherlands, and Fokke M. De Jong, Zeist, Netherlands, assignors to INfill Systems B. V., Delft, Netherlands

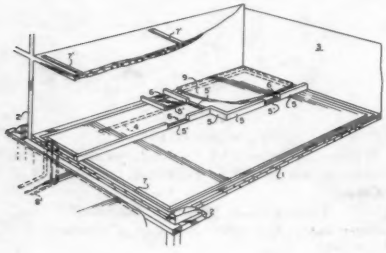
PCT No. PCT/NL87/00038, § 371 Date Aug. 11, 1988, § 102(e) Date Aug. 11, 1988, PCT Pub. No. WO88/04713, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 16, 1987, Ser. No. 249,185

Claims priority, application Netherlands, Dec. 16, 1986, 8603201; May 19, 1987, 8701196

Int. Cl.[5] E04B *1/00*

U.S. Cl. 52—741 31 Claims



4. The method of constructing a building having different categories of utility lines at multiple, separated vertical levels in the same floor structure whereby the utility lines may be installed in orderly sequence of different levels without interference in routing among the lines, which comprises the steps of:

providing a building structure having a horizontal, sidewall-surrounded load-bearing floor layer presenting an upper surface level and a lower surface level, and defining an occupancy area;

providing at least a first channel in said floor layer so as to lie between said upper surface level and said lower surface level;

providing a first category of utility lines within said first channel so that any such utility line is disposed at a level below said upper surface level;

providing a layout of partitioning ducts on the load-bearing floor layer with the layout defining selected rooms in accord with a freely selected layout of rooms within the occupancy area;

providing interruptions in said partitioning ducts at door openings to the rooms;

providing a further category of utility lines within at least one of said partitioning ducts so as to be at a level which is above said upper surface level;

providing a covering layer of finite thickness on the upper surface of the load-bearing floor layer to form sides of sill recesses bounding the interruptions;

lengthwise bridging the sill recess of said at least one of said partitioning ducts with the further category of utility lines;

covering the sill recesses; and

providing partition walls atop said partitioning ducts to close off said rooms.

4,984,409

PROCESS AND APPARATUS FOR THE TESTING OF CARTON PACKS

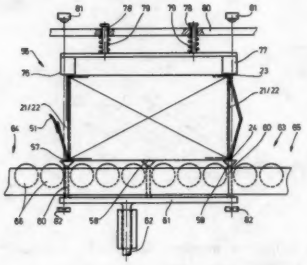
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Continuation of Ser. No. 346,449, May 1, 1989, abandoned. This application Aug. 16, 1990, Ser. No. 569,253

Claims priority, application Fed. Rep. of Germany, May 18, 1988, 3816856

Int. Cl.[5] B65B *57/02, 57/04*

U.S. Cl. 53—53 16 Claims



1. A process for testing cartons for correct construction of bottom and cover walls formed by inner and outer folding flaps and fixed by means of adhesive bonding, in which immediately after said walls (19, 20) are completed by folding said folding flaps (15, 16; 17, 18), applying pressure to said walls, such that folding flaps of incorrectly formed walls move out of a wall plane, the cartons initially moving along a path of motion and then in a feed stream, said process comprising the steps of:

applying pressure to each wall to be tested, said pressure being produced by means of contact pressure members each engaging a wall adjoining the wall to be tested in the region of carton edges located at mutually opposite sides of a carton to be tested, and which contact pressure members move towards one another into the path of motion of the cartons (10) and thereafter in opposite directions out of said path of motion; and selecting defective cartons (10) out of the feed stream.

4,984,410

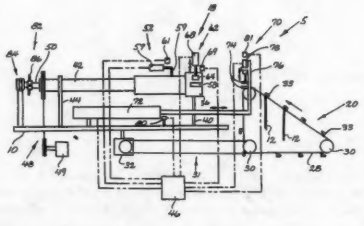
APPARATUS OF WINDING AND PACKAGING SHOELACES INTO PAIRS

William R. Gribbins, Lincolnton, N.C., assignor to General Shoelace Co., Louisville, Ky.

Filed Jul. 24, 1989, Ser. No. 383,718

Int. Cl.[5] B56B *27/06, 63/04*

U.S. Cl. 53—116 12 Claims



1. An apparatus for winding and packaging shoelaces into flattened coiled packages comprising:

a winding station for winding a pair of shoelaces into a circular coil configuration comprising a cylindrical mandrel about which the shoelace pairs are wound into a shoelace pair coil, the cylindrical mandrel being mounted for rotation about its longitudinal axis and for movement in both directions along its longitudinal axis, a cylindrical shoelace coil confining sleeve concentrically receiving the cylindrical mandrel, the confining sleeve being mounted in a fixed position against rotation and against movement along its longitudinal axis, and a doffing sleeve concentrically received within the cylindrical mandrel, the doffing sleeve being mounted for rotation about its longitudinal axis and against movement along its longitudinal axis, a drive tube operatively associated with the doffing sleeve for rotating the doffing sleeve, the drive tube being mounted for rotation about its longitudinal axis, a mandrel shifting shaft operatively associated with the mandrel for rotating the mandrel and for moving the mandrel along its longitudinal axis, the shifting shaft being concentrically disposed within the doffing sleeve drive tube for longitudinal movement within the drive tube and for rotation with the doffing sleeve about the coaxis of the drive tube and mandrel shifting shaft, means for rotating the doffing sleeve drive tube, transmission means in driven operative association with the doffing sleeve drive tube and in selective driving operative association with the mandrel shifting shaft;

a coiled shoelace pair flattening station next to the winding station for receiving wound shoelace pairs from the winding station and flattening the shoelace pair circular coil into an oblong coil;

a label delivery station at the flattening station for positioning a label across a flattened shoelace pair coil in the flattening station;

a wrapping station located next to the flattening station in alignment with the label delivery station for receiving the flattened shoelace pair coil from the flattening station and a label disposed across the flattening station and wrapping the label circumferentially around the flattening shoelace coil pair to form the flattened coil package;

programmable central control means for controlling the operation of the winding station, coiled shoelace pair flattening station, label delivery station, and wrapper station in timed relationship, the programmable central control means including programmable counting means in which is stored a predetermined number of revolutions of the winding cylindrical mandrel corresponding to the length of the shoelace to be wound into a coil;

winding station revolution determining means for determining the number of revolutions made by the cylindrical mandrel as it wins a shoelace pair into a coil, the revolution determining means being operatively associated with the mandrel shifting shaft and being operatively associated with the central control means; and,

the transmission means being operatively associated with the central control means to disengage the transmission when the predetermined number of revolutions of the cylindrical mandrel has been counted by the counting means of the central control means.

4,984,411

METHOD OF, AND APPARATUS FOR, FABRICATION OF PORTABLE TUBULAR-SHAPED PACKAGES FORMED OF PRINTED PRODUCTS, SUCH AS NEWSPAPERS, PERIODICALS AND THE LIKE

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG., Hinwil, Switzerland

Continuation of Ser. No. 49,586, Apr. 30, 1987, Pat. No. 4,811,548, and a continuation of Ser. No. 315,073, Feb. 24, 1989. This application Feb. 24, 1989, Ser. No. 315,074

Claims priority, application Switzerland, May 2, 1986, 1815/86

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[5] B65B *61/14, 63/04*

U.S. Cl. 53—118 **7 Claims**

1. An apparatus for fabricating portable, substantially tubular-shaped packages from printed products, such as newspapers, periodicals and the like, comprising:

means for winding up into a package roll printed products infed in an imbricated formation, with the thus formed package roll having a hollow interior region and an outer surface;

means for placing a holding element tight around the package roll in order to take up a peripheral force to retain together said package roll;

means for guiding an elongate carrying element through the hollow interior of the package roll and along the outer surface of the package roll; and

means for forming from such elongate carrying element an endless manual carrying loop of a length greater than a distance about the outer surface of the package roll and through the hollow interior region of the package roll so that the elongate carrying element extends loosely around the package roll to allow the insertion of carrying means between the package roll and the elongate carrying element.

4,984,412

HOPPER APPARATUS

Everett N. Flan, Macon, Ga., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Feb. 26, 1990, Ser. No. 485,023

Int. Cl.[5] B65B *11/06, 49/00, 51/00*

U.S. Cl. 53—387 **9 Claims**

1. A hopper for folding the end flaps of a film overwrapper across the ends of a carton circumscribed by the overwrapper to complete the packaging of the carton comprising:

first and second spaced apart, parallel side walls;

a back wall perpendicular to and spanning the space between the side walls, said side walls having back vertical edges and said back wall being affixed to the back vertical edges of the side walls;

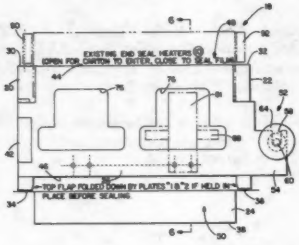
an access door pivotably attached to the verticals front edge of the first side wall for movement between a closed position spanning the space between the side walls and parallel to the back wall closing the entire front side of the hopper and an open position away from the space between the first and second side walls completely opening the front side of the hopper;

said first and second side walls, said top back wall, and said

access door having top edges, said top edges in the closed position cooperating to define a top open end of the hopper;

said first and second side walls, said back wall, and said access door having bottom edges, said bottom edges in the closed position cooperating to define a bottom open end of the hopper; and,

latch means interconnecting the access door and the second side wall to latch the access door in the closed position.



4,984,413

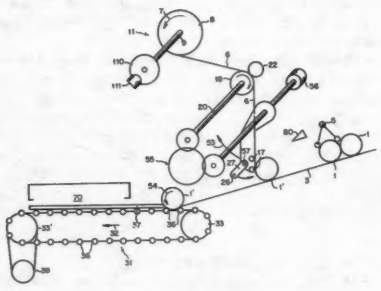
MACHINE AND METHOD FOR OVERWRAPPING CYLINDRICAL ARTICLES

Guy Cosmo, Selden, N.Y., assignor to K. C. Technical Services, Inc., Bohemia, N.Y.

Continuation-in-part of Ser. No. 342,110, May 22, 1989, Pat. No. 4,945,707. This application Aug. 30, 1989, Ser. No. 400,374

Int. Cl.[5] B65B *11/56, 11/04*

U.S. Cl. 53—465 **13 Claims**



1. A machine for wrapping generally cylindrical articles comprising:

a supply reel rotatably mounted in said machine for unreeling a web of sheet material having a leading edge;

conveyor means for transporting said articles along a predetermined path;

an inclined infeed table for supplying said articles solely by means of a gravity feed to said conveyor means;

article feed and restraint means disposed adjacent said infeed table for successively feeding said articles to said conveyor means, movable between a first position, in which said means stops the gravity feed of said articles fed successively thereto, and a second position in which said articles are allowed to successively move by gravity forward for deposit on said conveyor means;

means for supplying the leading edge of said sheet material between said article feed means and said cylindrical articles;

means for successively adhering said leading edge of said sheet material to said articles; and

transverse cutting means operatively acting with said article feed means for severing a predetermined portion of said sheet material so that said predetermined portion may be wrapped around each of said articles as they roll by gravity forward toward said conveyor means, said articles always rotating in the same direction as they move from said infeed table to said conveyor means and as said articles move along said conveyor means.

4,984,414

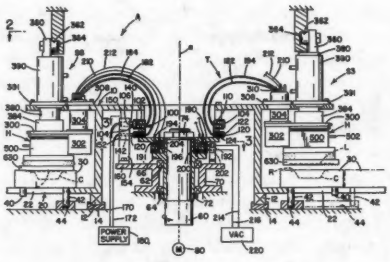
APPARATUS AND METHOD FOR SEALING A LID ONTO A CONTAINER

George D. Pfaffmann, Farmington Hills, Mich.; Charles S. Kubis, Palso Heights, Ill.; John P. Currie, Boaz, Ala.; Norbert R. Balzer, Warren, Mich.; John Walter, Evergreen Park, Ill., and Graham R. Adams, Boaz, Ala., assignors to Continental Can Company, Inc., Norwalk, Conn.

Division of Ser. No. 254,837, Oct. 7, 1988, Pat. No. 4,941,306. This application Feb. 7, 1990, Ser. No. 476,245

Int. Cl.[5] B65B *51/22, 51/14, 7/28*

U.S. Cl. 53—478 **16 Claims**



1. A method for sealing a flat lid with a lower layer of heat bondable material onto the upper, generally flat surface of a generally flat flange extending around the periphery of an access opening in a container for hermetically storing a substance susceptible to deterioration when exposed to atmosphere for a prolonged time, said method comprising the steps of:

(a) providing a turret having a given number of circumferentially spaced stations, each station having an inductor;

(b) rotating said turret about a vertical axis whereby said stations move along a generally circular path;

(c) loading a container filled with said substance onto a station of said turret at a first position on said path;

(d) locating a lid over said container at a second position on said path; and

(e) inductively heating said heat bondable material by an inductor at a selected station from a single, fixed high frequency power supply while said lid is forced against said flange by said inductor as said selected station moves in an arcuate path at a third position on said path whereby said lid is sealed onto said flange of said container as a station moves along said arcuate path.

4,984,415

METHOD AND APPARATUS FOR BLOCKADING AN OPENING THROUGH A CYLINDRICAL MOUTHPIECE OF A SYNTHETIC RESIN CONTAINER

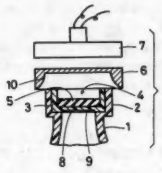
Nihee Kuroda, Osaka, Japan, assignor to Fuso Pharmaceutical Industries, Ltd., Osaka, Japan

Division of Ser. No. 178,342, Apr. 6, 1988, abandoned. This application Feb. 13, 1989, Ser. No. 296,668

Claims priority, application Japan, Apr. 7, 1987, 62-85332; Nov. 11, 1987, 62-284973

Int. Cl.[5] B67B *1/04, 1/08;* B65B *7/28, 51/10*

U.S. Cl. 53—478 5 Claims



1. A method of blockading an opening through a cylindrical mouthpiece of a synthetic resin container, comprising the steps of:

fitting a disk-shaped rubber stopper within the cylindrical mouthpiece of said synthetic resin container so as to blockade the opening thereof; and

press-heating the cylindrical mouthpiece of the synthetic resin container against an upper portion of said disk-shaped rubber stopper by covering the mouthpiece of the synthetic resin container with a metallic mouthpiece forming cap having an inner surface coated with Teflon, and pressing a welding heater against an upper surface of said metallic mouthpiece forming cap, such that an upper portion of the cylindrical mouthpiece becomes integrally fixed about an entire circumference thereof to said upper portion of said disk-shaped rubber stopper, to thereby unite said disk-shaped rubber stopper and the cylindrical mouthpiece of the synthetic resin container as a single body.

4,984,416

APPARATUS AND METHODS FOR REMOVING FOLDS IN THE CONFRONTING MATERIAL AT THE OPEN EDGES OF FLEXIBLE PACKAGING MATERIAL PRIOR TO SEALING

Horace W. Duke, Rte. 1, Box 165, Thomasville Rd., Chapmansboro, Tenn. 37035

Filed Jan. 18, 1989, Ser. No. 298,407

Int. Cl.[5] B65B *7/02*

U.S. Cl. 53—480 23 Claims

1. Apparatus for eliminating overlapping material in the open edge of a pliable package comprising:

a first means engaging said package edge for moving said edge along a predetermined path in a selected direction and at a selected speed;

first and second pinch wheels located along said predetermined path and in opposing relationship with each other such that their circumferential edges are substantially in contact with each other so as to engage and grip said package edges;

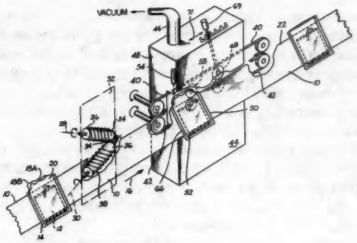
second means located downstream of said pinch wheels for engaging and moving said package edges with a first known torque along said predetermined path;

control means for providing control signals;

drive means responsive to control signals provided from said control means for independently driving said first and second pinch wheels;

said control signals firstly causing said drive means to drive said pinch wheels so as to move said package edge in said selected direction and at a speed greater than said selected speed while said package edge is engaged by both said first means and said first and second pinch wheels so as to pull said package edge taut therebetween; and

said control signals secondly causing said pinch wheels to be



biased against allowing said package edge to move in said selected direction, with a second torque which is less than said first known torque, while said package edge is engaged between said pinch wheels and said second means so as to eliminate overlapping material in said package edges.

4,984,417

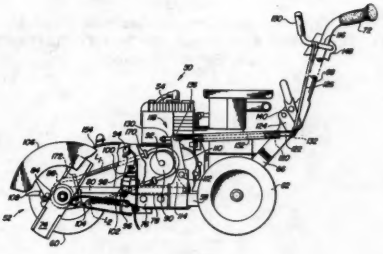
EDGER WITH BELT BRAKING DEVICE

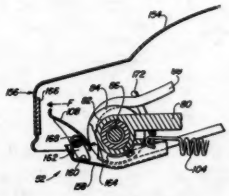
Stephen A. Braun, Horicon; Michael J. O'Neill, Mayville; Roger W. Curry, Horicon, all of Wis.; James R. Titze, Bloomington; Donald E. Niosi, Prior Lake, both of Minn.; Tetsuzo Fujikawa, Kobe, Japan; Makizo Hirata, Hyogo, Japan, and Michio Nishimura, Kobe, Japan, assignors to Deere & Company, Moline, Ill.

Filed Sep. 8, 1989, Ser. No. 404,914

Int. Cl.[5] A01D *34/84*

U.S. Cl. 56—11.3 16 Claims





7. An edger including:

a frame with front and side portions;
at least one ground engaging wheel supporting the frame;
power means carried on the frame;
a first pulley coupled with and driven by the power means;
a cutter element; and
mechanism for drivingly engaging the cutter element including:
bracket means carried on the frame including a guide means;
an elongated member carried by the guide means for back and forth movement between first and second positions;
a support housing secured to one end of the member;
shaft means coupled with the support housing;
means mounting the cutter element on the shaft means;
a second pulley coupled with the shaft means;
belt means entrained around the first and second pulleys;
control means for shifting the elongated member between its first position, whereat the second pulley is moved away from the first pulley and the belt means is drivingly engaged with both pulleys and
its second position whereat the second pulley is moved towards the first pulley and the belt means is drivingly disengaged;
a brake lever carried by the support housing, mounted for swinging movement between a first position in contact with the belt means and a second position moved away from said belt means;
biasing means urging the lever towards its first position; and
a lever contact surface carried by the frame, said surface being adjacent the brake lever and engageable with the lever when the elongated member is moved to its first position.

4,984,418

MOWING MACHINE

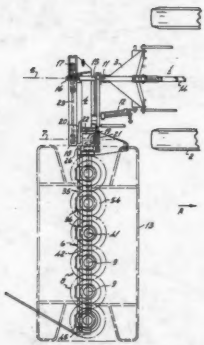
Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Continuation of Ser. No. 88,974, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 878,520, Jun. 23, 1986, abandoned, which is a continuation of Ser. No. 743,870, Jun. 11, 1985, abandoned, which is a continuation of Ser. No. 498,196, May 9, 1983, abandoned. This application Feb. 7, 1989, Ser. No. 307,151

Claims priority, application Netherlands, Sep. 10, 1981, 8104178; PCT Int'l Appl., Sep. 9, 1982, PCT/NL82/00029

Int. Cl.[5] A01D *34/66*

U.S. Cl. 56—13.6 **28 Claims**



1. A mowing machine comprising:
an elongated main frame, said main frame further comprising a plurality of longitudinally spaced driving units;
cutting units driven by said driving units comprising rotating wheel means adapted to drive a corresponding said cutting unit;
an elongated, narrow, integrally formed, single-piece, continuous main drive shaft with a non-circular cross-section passing through said main frame drivingly engaging each said wheel means, said drive shaft having a speed of rotation at least double that of said rotating wheel means;
and means for driving said drive shaft at a high speed of revolution, said drive shaft's thin structure being the means for reducing the height of said cutting unit above the ground, recessing the leading edge of portions of said mainframe between said driving units such that crop buildup does not interfere with mowing effectiveness, and together with said high speed of revolution performing the function of absorbing the forces introduced by said cutting units striking solid obstacles such that damage to the machine does not occur when said drive shaft is rotating at said high speed of rotation.

4,984,419

APPARATUS FOR MOUNTING GRASS BOX OF MOWER

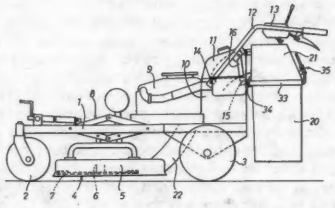
Kelichi Sampei, and Masami Kawasaki, both of Osaka, Japan, assignors to Kubota, Ltd., Osaka, Japan

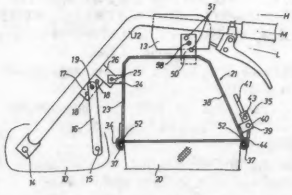
Filed Jul. 27, 1989, Ser. No. 385,450

Claims priority, application Japan, Aug. 5, 1988, 63-104437; Aug. 11, 1988, 63-106916

Int. Cl.[5] A01D *34/70*

U.S. Cl. 56—202 **17 Claims**





1. In a mower, comprising:
a machine body;
a grass box disposed in rear of said machine body;
a cover fitted to said grass box;
a mowing unit mounted to said machine body for mowing grass;
a duct through which the mowed grass is thrown into said grass box; and
an apparatus for mounting a grass box of said mower, characterized in that said machine body is fitted with said cover and a pair of right and left guide rails laid to and fro under said cover, said pair of guide rails having open channels thereof formed inwardly, and said grass box is removably inserted on said guide rails from the rear side, wherein an upper end open edge of said grass box is pro-

vided with a rectangular frame body, opposing bilateral parts of which are slidable on said guide rails.

4,984,420

DUMPING APPARATUS FOR GRASS CATCHER

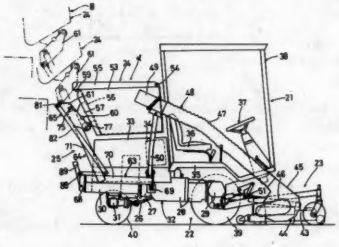
Kazuo Samejima; Hiroaki Kawakita; Yoshikazu Togoshi; Yoshiaki Matsuda; Takao Sakatsuji, all of Osaka, Japan, and Colin Fulford, Compton, Calif., assignors to Kubota, Ltd., Osaka, Japan

Filed Feb. 6, 1989, Ser. No. 307,389

Claims priority, application Japan, Feb. 12, 1988, 63-31357; Feb. 12, 1988, 63-31358

Int. Cl.[5] A01D *34/70, 90/10*

U.S. Cl. 56—203 10 Claims



1. A dumping apparatus for a grass catcher wherein the gras catcher, for collecting grass clippings delivered from a grass cutting unit through duct means, is mounted in a horizontal posture at an upper rear position of a vehicle body, the grass catcher being liftable and tiltable rearwardly by raising a forward part thereof higher than a rear part to discharge the grass clippings contained therein, said dumping apparatus comprising:

a lifting mechanism including a pair of right and left guide members fixed to and extending rearwardly and upwardly from rear positions of the vehicle body, and a movable member mounted in each of the guide members to be rearwardly and upwardly extendible and retractable;

a bracket fixed to a rear surface of said grass catcher, said bracket having an intermediate portion and a pivotable connection connecting said intermediate portion through a horizontal axis with an upper end of the movable member for pivotal movement of said bracket towards and away from said movable member, said bracket including a contact portion at a lower forward end thereof for detachably contacting a member of said lifting mechanism to maintain the grass catcher in the horizontal posture; and

a dumping mechanism including a hook attached to each of said guide members, and a pair of right and left restraining members each having an upper end connected through a pivot axis to an upper rear position of said bracket, and an engaging element at a lower end thereof upwardly movable, with the extension of said movable member, along each of said guide members into engagement with said hook, whereby rearward and upward extension of said movable member from the state where the engaging element is in engagement with said hook causes pivotal movement of said bracket about said pivot axis to pivot the lower forward end of said bracket upwardly and outwardly from between said restraining members.

4,984,421

PROCESS AND MACHINE FOR HARVESTING FRUITS OR SIMILAR ITEMS SCATTERED ON THE GROUND

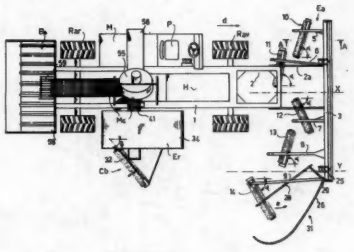
Maurice Dreux, Les Savignattes - Esglottes, 47120 Duras, France

Filed Oct. 25, 1989, Ser. No. 426,955

Claims priority, application France, Oct. 27, 1988, 88 14248

Int. Cl.[5] A01D *51/00*

U.S. Cl. 56—328.1 17 Claims



1. An agricultural machine for harvesting fruit or similar articles scattered on the ground, comprising:

a frame (1) including ground engaging wheels and displacement means for displacing the frame in a direction (d),

a plurality of rotating projecting members (10–14, 32, 33) of an elongated form, carried by the frame in such a manner as to be positioned in the vicinity of the ground in a direction oblique to the direction of displacement (d),

means (2) for rotatably driving each projecting member, able to drive its periphery with a movement (r) assuring the projection of the fruit toward the front,

a receiving belt (34) carried by the frame and having an active section (34*d*) situated at the side of the rear edge of one or more of the projecting members in such a manner as to extend below and longitudinally beyond said members,

means for driving the receiving belt so as to confer upon its active section (34*a*) a direction of displacement opposite to the direction of displacement of the frame, and

means (41, 52) for conveying the fruit from the receiving belt toward a hopper (54),

said machine further comprising a first line of front projecting members (10–14), arranged along a predetermined width with an overlap at their ends with the exception of two passages (X, Y) arranged to cause the formation of two windrows, and a second line comprising two rear rotating projecting members (32, 33) situated to the rear of each of said passages, the receiving belt (34) being situated between said rear members so as to cooperate with the edges of said rear rotating members, and to be hidden to the rear of the members of the first line of rotating members (12, 13), said wheels being positioned so as to be hidden behind the leading projecting members (10–13).

4,984,422

TEXTILE TUBE SUPPORT DEVICE HAVING POSITION INDICATING MEANS

Norbert Stadele, Goppingen, and Martin Maeser, Albershausen, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Dec. 12, 1989, Ser. No. 448,884

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1988, 3841812

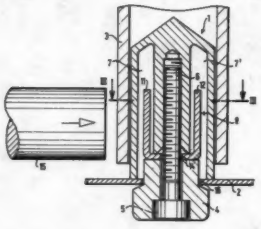
Int. Cl.[5] D01H *9/18;* B65H *67/06*

U.S. Cl. 57—281 16 Claims

1. In a textile machine having a plurality of tubes adapted to

support windings of textile material thereon, a plurality of tube support devices for individually supporting the tubes, a tube transfer device at a tube transfer position for transferring tubes between the tube support devices and a tube handling device and a transport device for transporting the tube support devices to the tube transfer position for tube transfer operations by the tube transfer device, each tube support device comprising:

an upright member for individually supporting a tube with said upright member projecting into the tue for support thereof in a substantially upright disposition, said upright



member having an interior recess extending upwardly therein; and

indicator means disposed within said recess, said indicator means being readable through said upright member and cooperating with the transport device to indicate the presence of said upright member at a sensing position located at predetermined location with respect to the tube transfer position whereby the transport device reliably positions each tube support device at the tube transfer position for transfer of a tube between said upright member and the tube handling device.

4,984,423

AERODYNAMIC LOADING IN GAS TURBINE ENGINES

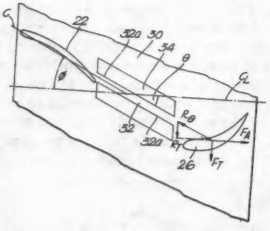
Trevor H. Speak, Dursley, England, assignor to Rolls-Royce PLC, London, England

Filed Jun. 7, 1989, Ser. No. 362,865

Claims priority, application United Kingdom, Jun. 22, 1988, 8814779

Int. Cl.[5] F02C 7/20

U.S. Cl. 60—39.31 **8 Claims**



1. A means for re-orienting and reacting an applied axial gas pressure load experienced by a combustion chamber in a gas turbine engine having a compressor with outlet guide vanes situated therein, each vane having a chord line, the means comprising: a load bar, angled relative to the applied load and being integrally provided in said combustion chamber with an end associated with an outlet guide vane of the compressor; the chord line of each outlet guide vane being angled relative to the applied load to be parallel to the load bar.

4,984,424

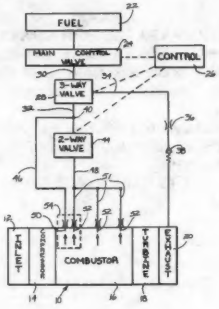
FUEL INJECTION SYSTEM FOR A TURBINE ENGINE

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 156,219, Feb. 16, 1988. This application Nov. 17, 1988, Ser. No. 272,407

Int. Cl.[5] F23R 3/28

U.S. Cl. 60—39.94 **8 Claims**



1. A fuel injection system for a turbine engine having a combustor with at least one start injector and a plurality of main injectors, said system comprising:

a main control valve;

at least one start fuel line adapted to be connected to a start injector;

a plurality of main fuel lines adapted to be connected to respective main injectors;

a first valve connected to said main fuel lines and openable to allow fuel to flow thereto;

a purge fuel line; and

valve means disposed between and connected to said main control valve and said first valve and connected to said start fuel line and said first valve for (a) allowing the flow of fuel to said start fuel line and said first valve and (b) connecting said start fuel line and said first valve to said purge line while halting flow to all of said main and start injectors.

4,984,425

ACCELERATION CONTROL FOR A GAS TURBINE ENGINE

Jesse W. Smith, Stuart, Fla., assignor to United Technologies Corporation, Hartford, Conn.

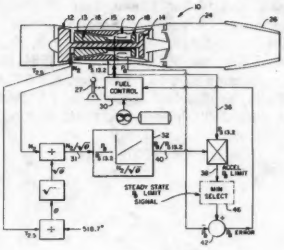
Filed May 30, 1989, Ser. No. 359,186

Int. Cl.[5] F02C 9/28

U.S. Cl. 60—39.161 **9 Claims**

1. An acceleration control for a gas turbine engine for controlling the acceleration mode of said engine, said engine having a compressor subject to stall, a burner for generating engine working fluid medium, a turbine powered by said engine working fluid medium for driving said compressor, fuel control means responsive to engine operating parameters for controlling the flow of fuel to said burner, said acceleration control comprising means for establishing a stall margin for said compressor including means responsive to compressor rotor speed for establishing a first signal simulating a compressor stall limit indicative of the ratio of the pressure of said burner and the pressure at another station in said engine, means responsive to actual burner pressure for generating a second signal and means responsive to said first signal and said second

signal for adjusting said fuel control means to limit the flow of fuel to said burner wherein said stall margin is independent of



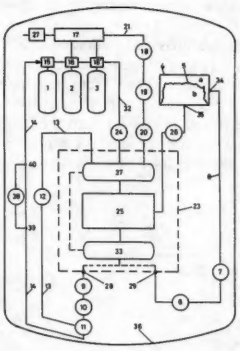
compressor bleed, power extraction from said engine and degradation of engine efficiency.

4,984,426

CLOSED CIRCUIT SYSTEM FOR RECYCLING THE EXHAUST GASES OF A COMBUSTION ENGINE

Giunio G. Santi, Via 3a Armata 6, 34123 Trieste, Italy

Filed Apr. 26, 1989, Ser. No. 343,954
Claims priority, application Italy, May 4, 1988, 20450 A/88
Int. Cl.[5] F01N *5/00*; F02M *25/06*
U.S. Cl. 60—281 **17 Claims**



1. A closed circuit system having an engine operating by recycling the exhaust gases, and including a set of fuel tanks and a set of oxygen tanks for liquid or gaseous oxygen comprising;

means for storing the water produced by the combustion in the same fuel tanks,

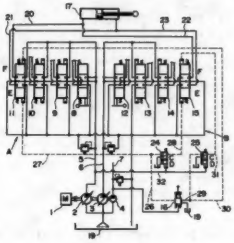
means for storing the CO_2 produced by the combustion, even in gaseous phase, in the same oxygen tanks after said tanks have been emptied of oxygen used to support the combustion, and wherein the storage temperature is slightly above the sea water temperature at a minimum storage pressure of 40 ata (absolute atmospheres).

4,984,427

CONTROL CIRCUIT FOR HYDRAULIC ACTUATOR

Wataru Kubomoto, Hiroshima, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 1, 1989, Ser. No. 401,768
Int. Cl.[5] F16H *39/46*
U.S. Cl. 60—428 **2 Claims**



1. A control circuit for a hydraulic actuator which is operated by a hydraulic operating circuit wherein discharge pressure oil flows of a pair of hydraulic pumps are supplied to a pair of independent dedicated hydraulic change-over valve sets and hydraulic changeovers valves of a hydraulic pilot type which form a part of the different change-over valve sets are changed over by a single pressure to obtain oil pressure flows which are then caused to join each other to operate said hydraulic actuator, wherein said control circuit comprises:

change-over valve means provided along pilot pipe lines communicating with a pilot oil chamber of the hydraulic change-over valve which forms a part of one of said hydraulic change-over valve sets;

means for normally biasing said change-over valve to a position wherein said pilot oil chamber of the hydraulic change-over valve is communicated with a tank;

means for changing over said change-over valve means, when a hydraulic pressure higher than a predetermined value acts upon the pilot oil chamber of said change-over valve, to another position in which said hydraulic oil chamber of the hydraulic change-over valve is communicated with said pilot pipe lines;

and a branch pipe line which braches from a pipe line for discharge oil under pressure of the hydraulic pump provided for supplying oil under pressure to the other hydraulic change-over valve set and which is connected to said pilot oil chamber of said change-over valve.

4,984,428

STIRLING ENGINE

Yutaka Momose, Anjo; Tetsumi Watanabe, Okazaki; Kouzi Hiraiwa, Toyohashi, and Tomokimi Mizuno, Chiryu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 28, 1989, Ser. No. 413,731
Claims priority, application Japan, Sep. 29, 1988, 63-242412
Int. Cl.[5] F02G *1/04*
U.S. Cl. 60—517 **4 Claims**

1. A Stirling engine comprising:

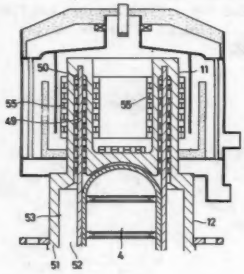
an expansion chamber defined in an expansion cylinder by an expansion piston;

a compression chamber defined in a compression cylinder by a compression piston and communicating with the compression chamber via a heater, a regenerator and a cooler;

the heater including an extended part of the expansion cylinder which extends from the expansion chamber toward an upper side and a hollow cylindrical member having a bottom and an annular area which receives the extended part therein;

an annular passage formed between an inner and an outer

circumference of the extended part and an inner wall surface of the annular area; and



a heat transfer fin arrangement provided on the inner and the outer surface of the extended part of the expansion cylinder.

4,984,429

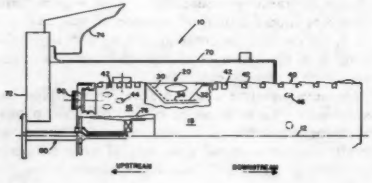
IMPINGEMENT COOLED LINER FOR DRY LOW NOX VENTURI COMBUSTOR

Jennifer Waslo, Scotia; Masayoshi Kuwata, Ballston Lake, and Roy M. Washam, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 25, 1986, Ser. No. 934,755

Int. Cl.[5] F02G *1/00*

U.S. Cl. 60—752 **6 Claims**



1. An improved gas turbine combustor of the type having an upstream combustion chamber and a downstream combustion chamber interconnected by a venturi throat region having an upstream wall and a downstream wall interconnected by an axial wall; a plurality of primary nozzles in annular array for introducing fuel into the upstream combustion chamber; a central nozzle for introducing fuel into the downstream combustion chamber; wherein the improvement comprises:

an annular shield positioned, in part, upstream from the venturi throat; the annular shield having a radially inwardly slanted portion and an axial portion;

a plurality of impingement cooling holes in the upstream wall of the venturi region directed at the radially inwardly slanted portion of the annular shield whereby impingement cooling of the slanted shield portion is effected; and further comprising a ring attached to the axial wall of the venturi region and having a free and extending downstream, the ring defining an acute angle with the downstream wall of the venturi region; and

an extended portion of the shield axial portion extending downstream and coaxial with the ring.

4,984,430

METHOD OF FABRICATING FROZEN FINE LIVER PIECES FOR ARTIFICIAL LIVER, APPARATUS FOR FREEZING THE SAME, AND FREEZING VESSEL

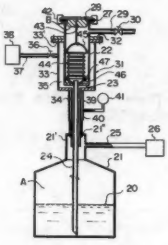
Yasuo Kuraoka, and Nobuo Sakao, both of Ibaraki, Japan, assignors to Hoxan Corporation, Sapporo, Japan

Division of Ser. No. 245,925, Sep. 16, 1988, Pat. No. 4,883,452, Continuation of Ser. No. 661,469, Oct. 16, 1984, abandoned. This application Sep. 15, 1989, Ser. No. 407,660

Claims priority, application Japan, Jan. 17, 1984, 59-6172; Mar. 2, 1984, 59-30260[U]; Mar. 16, 1984, 59-37533[U]; Mar. 16, 1984, 59-37534[U]

Int. Cl.[5] F25B *19/00*

U.S. Cl. 62—51.1 **13 Claims**



1. A freezing apparatus for fabricating frozen fine liver pieces for an artificial liver comprising:

a storage chamber for storing helium in a combination liquid-and-gaseous state,

gas phase pressurizing means for pressurizing the helium in the storage chamber to a predetermined pressure,

a freezing chamber for receiving the fine liver pieces to be frozen so that helium gas passing through the freezing chamber contacts the fine liver pieces,

a helium gas conduit dipped in the liquid helium in the storage chamber and connected to the freezing chamber, and

an exhaust conduit provided with a control valve and coupled to the freezing chamber so that when the valve is opened helium gas flows from the storage chamber through the gas conduit, and through the freezing chamber relative to and in contact with the fine liver pieces to the exhaust conduit, to cause essentially instantaneous freezing of the fine liver pieces in the freezing chamber.

4,984,431

HIGH EFFICIENCY PURGE SYSTEM

Gordon L. Mount, W. Monroe, and James N. Cuny, Manlius, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 20, 1990, Ser. No. 540,954

Int. Cl.[5] F25B *47/00*

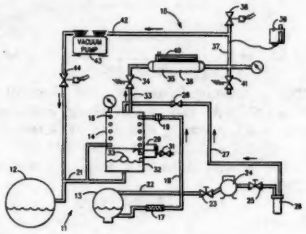
U.S. Cl. 62—85 **17 Claims**

8. A method of obtaining increased efficiency in removing non condensable gases from a refrigeration system by way of a purge chamber and vent circuit, wherein the improvement comprises the steps of:

providing a filter in the vent circuit;

passing the non-condensable gases, which are mixed with refrigerant that did not condense in the purge chamber,

through said filter and allowing the refrigerant to be absorbed thereby; and



periodically removing at least a portion of the absorbed refrigerant from said filter so as to reactivate the filter for a subsequent absorbing cycle.

4,984,432

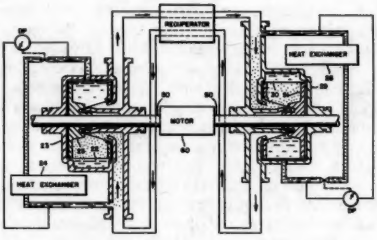
ERICSSON CYCLE MACHINE

John A. Corey, R.D. #1, Box 410, Melrose, N.Y. 12121

Filed Oct. 20, 1989, Ser. No. 424,807

Int. Cl.[5] F25B *9/00*

U.S. Cl. 62—87 **31 Claims**



1. A refrigeration system comprising:

a liquid-ring compressor having a liquid outlet, a liquid inlet, a gas outlet and a gas inlet;

a liquid-ring expander having a liquid outlet, a liquid inlet, a gas outlet and a gas inlet;

a recuperator having a first connector means which connects the compressor gas outlet to the expander gas inlet and a second connector means which connects the compressor gas inlet to the expander gas outlet, said recuperator including means whereby heat can be transferred between said first connector means and said second connector means;

a first heat exchanger comprising a connector means connecting said compressor liquid outlet to the compressor liquid inlet, said connector means being in contact with a heat transferring means whereby heat can be transferred from said connector means to said heat transferring means;

a second heat exchanger comprising a connector means connecting said expander liquid outlet to the expander liquid inlet, said connector means being in contact with a heat transferring means whereby heat can be transferred from said heat transferring means to said connector means; and

at least one motor means operatively connected to said expander and said compressor for driving said compressor and said expander.

4,984,433

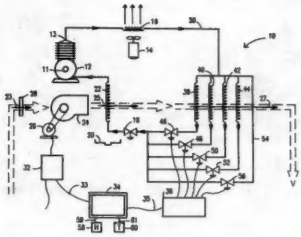
AIR CONDITIONING APPARATUS HAVING VARIABLE SENSIBLE HEAT RATIO

Donald J. Worthington, 3440 Eastlake Rd., #114, Palm Harbor, Fla. 33563

Filed Sep. 26, 1989, Ser. No. 412,683

Int. Cl.[5] F25B *41/04*; F25D *17/06*

U.S. Cl. 62—90 **15 Claims**



1. An air conditioning system including a compressor means and an evaporator means, comprising:

sensible heat sensing means disposed in sensing relation to return air from a space being air conditioned;

latent heat sensing means disposed in sensing relation to said return air;

a microprocessor means having a first input means that receives data from said sensible heat sensing means and a second input means that receives data from said latent heat sensing means;

a supply air fan;

a variable speed motor means disposed in driving relation to said supply air fan;

said microprocessor means having a first output means conductively coupled to said variable speed motor means;

a memory means being included in said microprocessor means;

said sensible and latent heat sensing means being operative to periodically supply data to said memory means;

a comparator means being including in said microprocessor means;

said memory means and said comparator means being conductively coupled to one another;

said comparator means being operative to compare incoming data from said respective sensing means and earlier data from said memory means and being further operative to periodically determine a rate of change in the difference between latent heat and sensible heat as sensed by said respective sensing means;

subcooling means for reducing the temperature of refrigerant fluid circulating in said air conditioning system prior to the entry of said refrigerant fluid into an expansion valve of said air conditioning system;

said subcooling means being positioned on a cool side of said evaporator means;

means for varying the amount of said subcooling;

said microprocessor means having a second output means conductively coupled to said means for varying the amount of said subcooling;

said microprocessor means being programmed to adjust the speed of said variable speed motor means and said means for varying the amount of said subcooling in response to input data supplied by said comparator means.

4,984,434

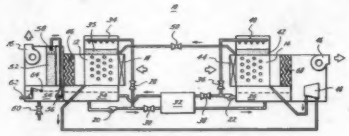
HYBRID VAPOR-COMPRESSION/LIQUID DESICCANT AIR CONDITIONER

John L. Peterson, 1203 West Creek Loop, Round Rock, Tex. 78681, and John R. Howell, 3200 Kerby La., Austin, Tex. 78703

Continuation of Ser. No. 405,624, Sep. 12, 1989, Pat. No. 4,941,324. This application May 3, 1990, Ser. No. 518,740

Int. Cl.[5] F25B *17/00*

U.S. Cl. 62—94 9 Claims



1. A hybrid air conditioning system, comprising:
a refrigerant;
a liquid desiccant;
an evaporator and a condenser, each having a heat and mass exchanger including tubes for receiving said refrigerant and fins attached to said tubes for receiving gravitationally delivered films of said liquid desiccant;
means for circulating said desiccant and said refrigerant between and within said evaporator and condenser; and
means for withdrawing cool dry air from said evaporator and warm moist air from said condenser.

4,984,435

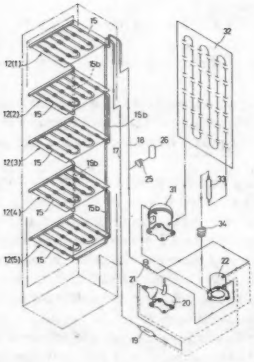
BRINE REFRIGERATING APPARATUS

Toshio Seino, Tokyo, and Norio Tatsumi, Takasaki, both of Japan, assignors to Dairei Co. Ltd., Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 376,589

Int. Cl.[5] F25D *17/02*

U.S. Cl. 62—434 14 Claims



1. A brine refrigerating apparatus comprising a cooling chamber which is divided into a plurality of cooling sections by shelves provided in the cooling chamber, said shelves comprising at least an uppermost shelf and a lowermost shelf, each shelf having a brine pipe in which a cold brine flows so as to form a continuous brine passage between said shelves, said apparatus including a feed line which extends longitudinally to the height of said uppermost shelf and bends downward in connecting relation to a brine pipe of said lowermost shelf of said brine refrigerating apparatus, and a cold brine feeding device connected to said continuous brine passage, said cold brine feeding device having a circulating pump for feeding said cold brine to said continuous brine passage, wherein said brine feeding device is located below said cooling chamber so as to enhance the stability of said brine refrigerating apparatus.

4,984,436

THREAD EXCHANGE DEVICE, PARTICULARLY FOR KNITTING MACHINES

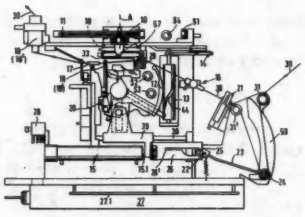
Siegfried Nürk, Albstadt-Pfeffingen, Fed. Rep. of Germany, assignor to SIPRA Patententwicklungs-und Beteiligungsgesellschfat mbH, Albstadt, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,588

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733796

Int. Cl.[5] D04B *15/62*

U.S. Cl. 66—144 16 Claims



1. A thread exchange device especially for knitting machines, comprising a knot unit for knotting, during a thread exchange, a new thread on an old thread movable in a thread running direction, said knot unit including a winding finger for forming a closed loop of the new thread, means cooperating with said winding finger during forming of the closed loop, a loop turning lever for engaging the old thread, forming an open loop thereof and laying the open loop of the old thread into the closed loop of the new thread all during continuous movement of the old thread in the thread running direction, a hook movable to project through the open loop of the old thread for engaging an end of the new thread, means for pulling said hook to thereby pull the end of the new thread through the open loop of the old thread and for retracting said loop turning lever, means for clamping and thereafter releasing the new thread, and means for cutting the old thread and clamping an end thereof; means arranged behind said knot unit in the thread running direction for establishing a thread compensation path of a fixed maximum length; and a compensator thread brake located between said establishing means and said knot unit and actuatable for a short time for tightening a knot during formation of the knot.

4,984,437

DRIVING MECHANISM FOR THE CONTROL OF THE NEEDLE-BAR AND TUBE-BARS IN FAST KNITTING MACHINES

Luigi O. Zorini, Via dei Mille 71, 27024 Cilavegna PV, Italy

Filed Sep. 14, 1989, Ser. No. 407,273

Claims priority, application Italy, Apr. 21, 1989, 20241 A/89

Int. Cl.[5] D04B *27/08*

U.S. Cl. 66—208 7 Claims

1. A driving mechanism for the control of the needle-bar and tube-bars in fast knitting machines, comprising:
a support bed provided with at least two side posts;
at least one drive shaft rotatably engaged through each of said posts;
a pair of swinging arms each rotatably connected to a first of said posts and fixedly engaging a needle-bar;
a pair of first driving connecting rods each of them exhibiting one end pivoted to one of said swinging arms and the

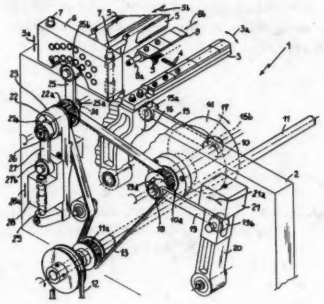
opposite end operatively engaged to one eccentric carried by said first drive shaft;

at least a second drive shaft rotatably supported with respect to said posts;

a pair of oscillating supports each of them being slidably engaged in a substantially vertical direction with one of said posts and engaging at least a tube-bar at one end thereof;

a pair of second driving connecting rods each exhibiting one end connected to one of said oscillating supports and the opposite end operatively engaged with a second eccentric carried by the second drive shaft; said first and second drive shafts being driven simultaneously in rotation in order to respectively cause the operation of the needle-bar according to a substantially horizontal oscillatory movement and the operation of the tube-bar according to a substantially vertical oscillatory movement, further comprising:

at least a pair of auxiliary swinging arms each pivoted to one of said posts;



at least a pair of first counterweights each integral to one of said auxiliary swinging arms;

at least a pair of first auxiliary connecting rods each of them having one end pivoted to one of said auxiliary swinging arms and the opposite end operatively engaged with one auxiliary eccentric mounted on the first drive shaft;

at least a pair of second counterweights each associated with one of the posts and slidably guided in a substantially vertical direction;

at least a pair, of second auxiliary connecting rods, each of them having one end pivoted to one of the second counterweights and the opposite end operatively engaged with a second auxiliary eccentric carried by the corresponding second drive shaft; said first and second auxiliary eccentrics being mounted in phase opposition relative to said first and second eccentrics in order to cause said first and second counterweights to oscillate in phase opposition relative to the oscillations performed by the needle-bar and tube-bars.

4,984,438

PROCESSING OF DENIM GARMENTS

Denis Batty, Huddersfield, assignor to Kedgwick Limited, Ossett, England

Filed Jan. 17, 1989, Ser. No. 298,102

Claims priority, application United Kingdom, Jan. 15, 1988, 8800937

Int. Cl.[5] D06F *21/02, 37/08*

U.S. Cl. 68—27 **2 Claims**

1. A washing machine comprising a rotatable washing drum arranged with its axis of rotation horizontal, said drum comprising:

(a) an archimedes screw;

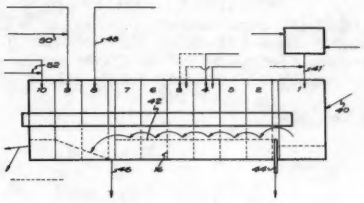
(b) an input end and an output end to said screw;

(c) first to nth screw washing chambers lying in sequence from the input end to the output end and defined between the turns of the screw;

(d) a leading edge to said screw at the input end and lying radially with respect to said axis; and

(e) lifter means for lifting and tumbling clothes to be washed in said chambers, said lifter means comprising:

(i) in the first chamber, at least two V-sectioned panels of different sizes extending between the screw turns and located on the periphery of the drum at the opposite



side of the drum from said leading edge, the panels being arranged with apices of the V-sections facing the axis of rotation; and

(ii) in the second to the nth−1 chambers, at least two V-sectioned panels extending between the screw scroll turns and located on the drum periphery at the opposite side of the drum from said leading edge, said panels being arranged with apices of the V-sections facing the axis of rotation.

4,984,439

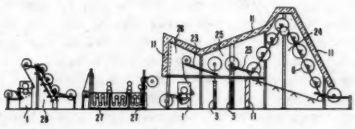
DISCONTINUOUS, EXPANDABLE MODULAR PROCESSING FOR FIBROUS MATERIALS AND SHEETINGS IN PLASTIC, PAPER AND METALS

Richard K. Smejda, P.O. Box 344, Paterson, N.J. 07544

Filed Oct. 28, 1985, Ser. No. 780,953

Int. Cl.[5] D06B *3/10*

U.S. Cl. 68—5 C **10 Claims**



1. A system for processing endless materials through a plurality of applicators, winders, resetters, rewinders and storage locations, wherein the improvement comprises:

a working area;

a discontinuous modular machine located adjacent said working area for the processing of substrates including fibers, sheeting and batches of cellulosic and synthetic materials, plastics and metal foils in a hostile environment, including a chamber supported overhead and generally closed on all sides, top and bottom, said chamber having a narrow opening slotted at the bottom of said chamber to enter said substrates from said working area, said opening being closed to prevent air from entering said chamber and preventing excess vapors escaping from said chamber to enable said vapors to condense on said substrates as they enter said chamber whereby said condensed vapors are returned to said chamber as condensate on said substrates; means at said working area to feed and process said substrates including two dual working stations, each working station equipped with drive means and brake means, to start, brake and stop, wind forward and wind back any number of times; additional means to lift and

lower said substrates, move said substrates forward and back and to interchange all available options to maneuver said substrates along the x,y-axis of the machine, and means to open the bottom and sides of said chamber to permit the entry and removal of said fibers, sheeting, and batches of cellulosic and synthetic materials, plastics and metal foils.

4,984,440

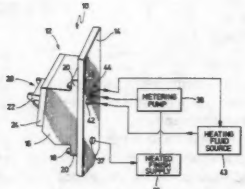
YARN FINISH APPLICATOR WITH INTERNAL FINISH HEATING CAPABILITY

James E. McCall, Signal Mountain, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 201,504, Jun. 2, 1988, abandoned. This application Dec. 5, 1989, Ser. No. 445,925

Int. Cl.[5] D06B *1/08*

U.S. Cl. 68—200 **2 Claims**



1. A yarn finish applicator for multifilament yarn comprising a body member providing a yarn contact surface including a slot with two side walls and a bottom, a metering pump for supplying a metered volume of heated finish from a heated finish supply to said applicator, a passage extending to an opening in said bottom of said slot through said body member so that finish supplied by said metering pump is supplied to said bottom of said slot and onto yarn passing through said slot by flowing through said passage, said bottom of said slot having a width such that the filaments of the yarn are splayed generally as a single layer as the yarn passes through said slot, and heating means in said body member for heating said finish in said passage as said finish flows to the yarn in said slot, said body member comprising a tip member providing said slot and a thermally conductive housing member attached to and supporting said tip member with said passage extending through said tip member and said housing member, said means for heating comprising at least one conduit in said housing and means for circulating a heated fluid through said conduit so that heat from said circulating fluid is transferred to said housing member to heat said finish in said passage, said heated fluid being circulated through said conduit being said heated finish from said heated finish supply.

4,984,441

ELECTRICALLY CONTROLLED BOLT LOCK

Guenter Mauer, Heiligenhaus, Fed. Rep. of Germany, assignor to Mauer GmbH, Heiligenhaus, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 387,654

Claims priority, application European Pat. Off., Aug. 2, 1988, 88112519

Int. Cl.[5] E05B *47/00*

U.S. Cl. 70—277 **5 Claims**

1. Electrically controlled bolt lock with a control plate which is positively connected to a bolt element, there also being a tumbler or the lock, the improvement comprising:

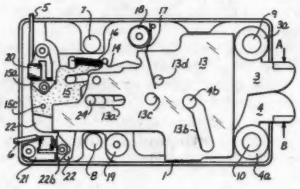
a first pin extending from and connecting to said control plate for engagement with the tumbler;

a second pin mounted to and extending from said control plate;

a spring biased armature lever pivotably mounted to said tumbler and having a control surface, said second pin engaging and operating said armature lever;

an armature on said armature lever;

a stationary electromagnet magnetically coupled to said armature; and



said second pin pivoting said armature lever whenever said electromagnet holds said armature on energization of the electromagnet to thereby place said tumbler into a release position.

4,984,442

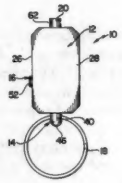
KEY HOLDER

Merritt D. Benson, 9 Southlake Dr., Barrington, R.I. 02806

Filed Jan. 22, 1990, Ser. No. 468,032

Int. Cl.[5] A47G *29/10*

U.S. Cl. 70—456 R **23 Claims**



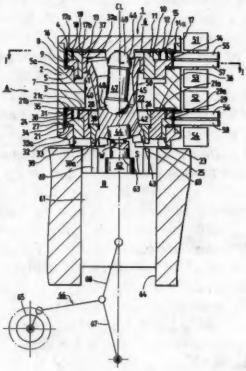
1. A key holder comprising a body portion, retaining means assembled on said body portion operative for releasably receiving and retaining a key thereon and plunger means on said body portion normally engaging said retaining means to retain the latter in a predetermined assembled position with said body portion wherein a key received on said retaining means in connected to said body portion by said retaining means, said plunger means being manually depressible for disengaging said plunger means from said retaining means to permit movement of said retaining means to a release position wherein said key is disconnectable from said body portion, said retaining means comprising releasable pin means releasably assembled on said body portion, said plunger means engaging said pin means to releasably retain it on said body portion, said releasable pin means including a terminal portion which projects outwardly from said body portion when said pin means is assembled therewith, and means for detachably securing a key to said terminal portion of said releasable pin means, said pin means being of elongated configuration, said plunger means including a J-shaped portion having spaced substantially parallel first and second legs which travel in substantially perpendicular relation to said pin means, said second leg normally engaging said pin means to retain the latter in assembled relation with said body portion, said first leg being manually depressible to disengage said second leg from said pin means.

4,984,443

PLASTIC WORKING METHOD AND APPARATUS

Takeaki Sato, Kasugai; Yoshihiro Kozaki, Inuyama, and Kunio Hirota, Aichi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 14, 1989, Ser. No. 436,032
Claims priority, application Japan, Nov. 18, 1988, 63-293194
Int. Cl.[5] B21J *13/02*
U.S. Cl. 72—67 11 Claims



1. A plastic working method with using a swivel type plastic working apparatus wherein a machine frame is provided and an upper die mounted on a die holder is pressed against a workpiece W on a lower die while swiveling the die holder, the die holder having an inclination axis intersecting with a vertical axis in the vicinity of a forging portion, and being swiveled about the vertical axis to thereby applying a plastic work to the workpiece, the plastic working method comprising the steps of:

providing a press link between the holder and the machine frame with one end of the press link being engaged rotatably about a point on the vertical axis relative to the machine frame and with the other end of the press link being engaged rotatably about a point on the inclination axis relative to the die holder;

disposing the die holder movable in a predetermined range in vertical direction along the vertical axis:

changing the inclination angle of the inclination axis relative to the vertical axis during the working; and

imparting a reciprocating motion to the upper die mounted on the die holder within a minute range in the direction of the vertical axis by the change in the inclination angle and the provision of the press link.

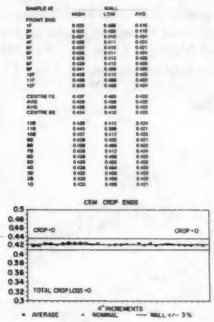
4,984,444

METHOD OF REDUCING TUBULAR PRODUCTS

Louis E. Franceschina, Mervis Dr., Beaver Falls, Pa.

Filed Apr. 26, 1989, Ser. No. 343,347
Int. Cl.[5] B21B *39/08*
U.S. Cl. 72—205 5 Claims

5. A method of rolling speed control of a stretch reducing mill for hot reducing of the diameter of tubular members of ferrous or non-ferrous material wherein the roll rotation speed differential between successive roll stands is varied as rolling progresses to roll the tubular member substantially without longitudinal tension as the front end portion enters and as the rear end portion leaves the roll stands, and with sufficient tension as the portion of the tube member intermediate the end portions is rolled to restrict wall thickness increase in the



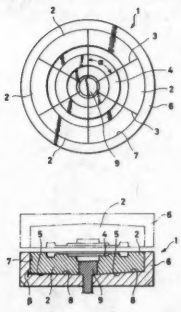
intermediate portion to the same amount produced in the end portions.

4,984,445

CERAMIC ISOTHERMAL FORGING DIE

Kiyoyuki Ohuchi, Tsukuba; Yoshinori Nakazawa, Ibaraki, and Kenichi Matsuno, Tsukuba, all of Japan, assignors to Agency of Industrial Science and Technology, Ministry of International Trade and Industry, Tokyo, Japan

Filed Apr. 13, 1990, Ser. No. 508,688
Claims priority, application Japan, May 18, 1989, 1-125439
Int. Cl.[5] B21J *13/02*
U.S. Cl. 72—360 5 Claims



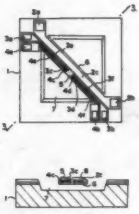
1. A ceramic isothermal forging die comprising a pair of disk-shaped die halves formed of ceramic and having die cavities formed in mating surfaces thereof and a pair of die half holders each having a recess for accommodating one of the die halves, each die half being divided into a plurality of radial segments having a bottom surface tapered away from its mating surface toward a center of the die, the recess of each die half holder having a floor tapered to become deeper toward the center of the die in such manner as to be complementary to the tapered bottom surfaces of the die segments.

4,984,446

GAS DETECTING DEVICE AND GAS DETECTING SYSTEM USING THE SAME

Shinji Yagawara; Wasaburo Ohta, both of Yokohama, and Junji Manaka, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd. and Ricoh Seiki Company, Ltd., both of Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,067
Claims priority, application Japan, May 27, 1988, 63-131098
Int. Cl.[5] G01N *27/12*
U.S. Cl. 73—31.06 34 Claims



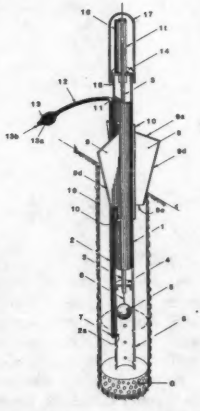
1. A gas detecting device comprising:
a substrate;
an insulating layer supported by said substrate;
first and second pairs of detection leads formed on said insulating layer;
a heater lead formed on said insulating layer, said first and second pairs of detection leads being heated by passing a heater driving current through said heater lead;
a gas sensitive layer formed of a gas sensitive material and provided so as to partially make contact with said first and second pairs of detection leads; and
a passivation layer formed so as to cover said first and second pairs of detection leads and said heater lead, a gas detection signal being output from said gas sensitive layer through one of said first and second pairs of detection leads.

4,984,447

SOILS PERCOLATION TESTING APPARATUS

James L. Phillips, 3 Rosewood Dr., Little Rock, Ark. 72209

Filed Sep. 1, 1989, Ser. No. 401,835
Int. Cl.[5] G01N *15/08;* G01F *23/58*
U.S. Cl. 73—38 8 Claims



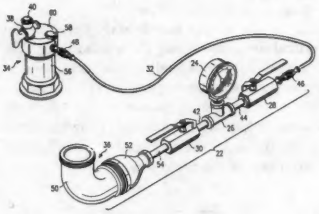
1. A soils testing apparatus, comprising, in combination,
an elongated upright hollow cylindrical shaft having a lower end formed with side wall apertures over a predetermined discrete distance to allow water communication between the inside and outside of the shaft;
a plurality of circumferentially spaced longitudinal T-tracks fastened in firm assembly on the outside of said shaft;
a cap on the top of said shaft and a spacer in a lower intermediate portion of said shaft;
a float rod guide tube interiorly of said shaft and being supported by said spacer and said cap and extending upwardly outside of said shaft;
a float rod in said guide tube having a float depending from the bottom end thereof and having a free upper end extending outwardly of said shaft and having coloration means to enhance its visibility,
said guide tube having graduated calibrated scale means at its upper end adjacent the free end of said float rod, and
a plastic globe fastened to the top of said shaft to enclose and protect the top of the guide tube, the top of the float rod and the scale means;
pump means comprising a tubing element on the outside of said shaft and having a foot valve and strainer at the lower end thereof,
said pump means including a hollow bulb means disposed in an accessible position exteriorly of said shaft; and
blade means complementary to said T-track means and having tapered pivoting edges for wedging engagement with the sides of a test hole;
whereby said shaft can be inserted into a test hole and the blade means thereafter inserted into the T-track means and vertically adjusted to center the shaft in the test hole;
said pump being operable to evacuate water from the test hole to such a depth as to set the float to a zero or null position and to permit measured calibrated changes in the test hole as a function or percolation rates.

4,984,448

LEAK DETECTOR AND UTILIZATION PRESSURE MANIFOLD

Mitchell Jordan, Pineville; James C. Mercer, Winnfield, both of La.; Charles Straughan, Lubbock, and Rex D. Hudson, DeSoto, both of Tex., assignors to Atmos Energy Corporation, Dallas, Tex.

Filed Nov. 16, 1989, Ser. No. 437,884
Int. Cl.[5] G01M *3/28*
U.S. Cl. 73—40.50 R 13 Claims



1. A method for performing a set-up procedure for a gas service that is connected to a customer's piping, comprising:
providing an intermediate volume;
providing a pressure measuring device in communication with the intermediate volume to allow measurement of the pressure thereof;
connecting the intermediate volume between a gas supply associated with the gas service and the customer's piping;
pressurizing the customer's piping through the intermediate volume;
isolating the intermediate volume from the gas supply such that the intermediate volume remains in communication with the customer's piping;
observing the pressure measuring device for a predeter-

mined amount of time, a reduction in pressure indicating the presence of a leak;

removing the intermediate volume from between the gas supply and the customer's piping and connecting the customer's piping to the gas supply; and

measuring utilization pressure prior to pressurizing the customer's piping through the intermediate volume, the steps of measuring utilization pressure comprising:

isolating the intermediate volume from the customer's piping,

connecting the gas supply to the intermediate volume,

allowing gas to escape from the intermediate volume at a predetermined rate, and

measuring the pressure in the intermediate volume.

4,984,449

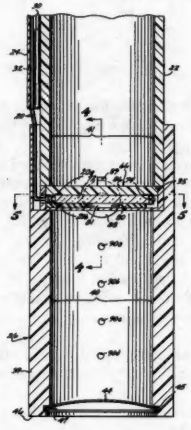
ULTRASONIC LIQUID LEVEL MONITORING SYSTEM

Joseph W. Caldwell, Danville, and Mark W. Slobodnik, Martinez, both of Calif., assignors to Caldwell System Corp., Livermore, Calif.

Filed Jul. 3, 1989, Ser. No. 376,666

Int. Cl.[5] G01M *3/24*; G01N *23/28*

U.S. Cl. 73—49.2 **17 Claims**



1. An ultrasonic probe for insertion into a tank for the measurement of the depth of petrochemical liquid stored in the tank, and for the detection of leaks in the tank in excess of a predetermined limit, the probe comprising:

a substantially cylindrical probe body having a top end and a bottom end, and a length in excess of the depth of liquid to be measured, the probe body having a back ranging target at the bottom end of the body, the probe body being made of a high thermal resistance material;

means for holding the probe body in a substantially vertical position within the tank, the probe body extending downward vertically through the surface of the liquid, the bottom end of the probe body being held in contact with the base of the tank;

transducer means positioned within the probe body at a first distance above the bottom end of the probe body for transmitting bi-directional pulses along the longitudinal axis to the surface of the liquid and to the bottom end of the probe body, the back ranging target being positioned to reflect a portion of the bi-directional pulses back to the transducer, and the transducer being operable to receive echoes from the back ranging target and from the surface of the liquid; and

at least two calibration rods within the probe body, between the transducer and the top end of the body, each calibration rod being positioned at a successively greater predetermined distance from the transducer, and each respective calibration rod having a larger reflective surface.

4,984,450

METHOD OF LEAK TESTING A TEST CONTAINER WITH A TRACER GAS

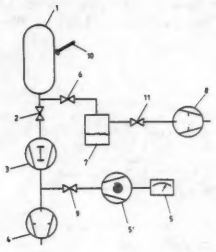
Heinz D. Bürger, Wertheim, Fed. Rep. of Germany, assignor to Alcatel Cit, Paris, France

Filed Aug. 23, 1989, Ser. No. 397,925

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1988, 382858

Int. Cl.[5] G01M *3/20*

U.S. Cl. 73—40.7 **2 Claims**



1. A method of leak testing a component, in particular a test container, in which a tracer gas is directed to one side of the component and the space on the other side is evacuated by a two stage pump assembly comprising in series and in order a molecular pump and a mechanical primary pump and connected to a tracer gas detector, said method including the additional step of temporarily connecting said space on said other side of the component to a water tank (7) containing water which is free from dissolved gases prior to the actual leak test, and wherein, prior to being connected with the water tank, the space on the other side of the component (1) is evacuated by said two stage pump assembly to a pressure in the range of 1 mbar to 0.01 mbar. Preferably to 0.1 mbar, thereby hindering parasitic helium atoms from migrating from the primary pump to said tracer gas detector.

4,984,451

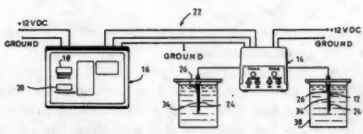
METHOD FOR DETERMINING PHYSICAL PROPERTIES OF LIQUIDS

Don J. Wilen, West Hempstead, and Frank Cooper, South Huntington, both of N.Y., assignors to Computer Instruments Corporation, Hempstead, N.Y.

Division of Ser. No. 278,223, Nov. 30, 1988, Pat. No. 4,949,572. This application Feb. 13, 1990, Ser. No. 479,291

Int. Cl.[5] G01N *9/28*

U.S. Cl. 73—53 **6 Claims**



1. A method for determining the physical properties or characteristics of a liquid or suspension, comprising:

providing a dip tube having an open end;

providing a vessel containing a liquid;

inserting said open end of said dip tube into said liquid;

flowing a selected volume of gas into said dip tube such that a bubble is released from said dip tube into said liquid;

discontinuing said flow of gas into said dip tube upon release of said bubble; and

detecting the pressure within said dip tube while said flow of gas into said dip tube has been discontinued.

4,984,452

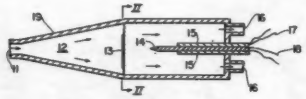
MULTIPLE CHANNEL AUTOMATIC CONCENTRATION METER

Robert G. Howard, Annapolis, and Edwin L. Zivi, Jr., Severna Park, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 27, 1978, Ser. No. 921,622

Int. Cl.[5] G01N *25/00, 11/00*

U.S. Cl. 73—61.3 **10 Claims**



1. A system for measuring the concentration level of additives in a liquid comprising:

a measurement probe having means for heating a portion of the probe above the temperature of the liquid and for producing an output signal whose magnitude is proportional to the rate at which heat is transferred away from the heated portion of said probe;

a flow producing means for maintaining a flow of said liquid past said probe at a constant velocity while said concentration levels are being measured;

means for producing isotropic turbulence in the flow of said liquid past said probe; and

means for processing the output signal from said probe to derive the concentration level of said additives in said liquid.

4,984,453

INDENTER FOR FRACTOEMISSION MEASUREMENT

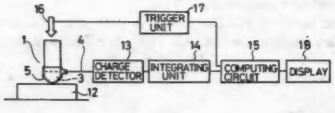
Yuji Enomoto, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Feb. 5, 1990, Ser. No. 475,278

Claims priority, application Japan, Feb. 13, 1989, 1-32930

Int. Cl.[5] G01N *3/48*

U.S. Cl. 73—81 **8 Claims**



1. An indenter for measuring the fractoemission and hardness of a test piece, comprising:

a nonconductive holder portion;

a front end portion constituted of a conductive material supported at the lower end of said holder portion and having a tip that contacts said test piece for producing indents and scratches in said test piece;

electromagnetic shielding which covers the exterior of the front end portion except for said tip; and

a lead wire, one end of which is electrically connected to said front end portion for external transmission of charged particles collected by said tip.

4,984,454

ENGINE TESTING SYSTEM

Roger K. Feller, Canton; Samuel R. Warner, Ypsilanti, and Janice D. Capriotti, Novi, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

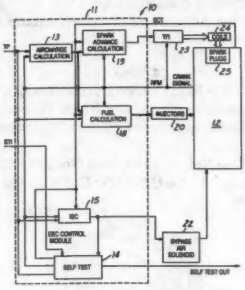
Division of Ser. No. 211,601, Jun. 27, 1988, Pat. No. 4,885,935.

This application Oct. 10, 1989, Ser. No. 419,569

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—117.3 **7 Claims**



1. An engine testing system for testing an engine having an engine throttle, by determining engine load based upon engine air charge comprising:

an air charge determination means coupled to said engine for determining engine air charge and generating a signal as a function of engine air charge which defines engine load by using a throttle position sensor for sensing the angle of the engine throttle and generating a signal as a function of engine throttle angle and thus as a function of engine air charge which defines engine load;

storage means for storing, as a function of engine speed and engine air charge, a desired engine operating parameter in a first table;

an engine speed sensor coupled to said engine for sensing engine speed and generating a signal as a function of engine speed;

reference means for storing a base air charge as a function of engine speed; and

a logic operation means coupled to said storage means, said reference means and said engine speed sensor for determining the desired engine operating parameter by using the determined air charge to determine a position on the air charge axis of said first table and using the sensed engine speed to determine a position on the engine speed axis of said first table, thereby determining the desired engine operating parameter for engine operation.

4,984,455

SYSTEM FOR DETECTING SPEED OF ENGINE FOR VEHICLE

Hiroshi Koyama; Masami Kondo, and Hiroshi Kawahara, all of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1990, Ser. No. 503,844

Claims priority, application Japan, Apr. 6, 1989, 1-40009[U]

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—118.1 **4 Claims**

1. A system for detecting the speed of an engine for a vehicle, the vehicle comprising a clutch connected to an output shaft of the engine, a transmission connected to the clutch, wheels connected to the transmission, and an actuator for controlling the amount of supply of fuel to the engine, the vehicle including a power transmission device having an out-

put side portion of the clutch and an input shaft and an output shaft of the transmission, said system comprising:

(a) a main rotation sensor for outputting a signal in accordance with the operation of the engine;

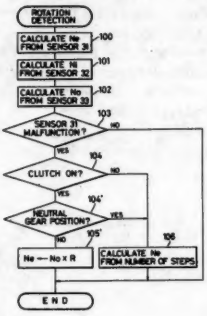
(b) an auxiliary rotation sensor for outputting a signal in accordance with the rotation of a portion of the power transmission device;

(c) connection condition detecting means for determining whether or not the output shaft of the engine is connected to said portion of the power transmission device;

(d) operation condition detecting means for detecting an operation condition of the actuator to output a signal representative thereof;

(e) malfunction detecting means for detecting malfunction of said main rotation sensor;

(f) main rotation speed calculating means for calculating the engine speed in accordance with the signal from said main rotation sensor;



(g) first back-up calculating means for calculating the engine speed in accordance with the signal from said auxiliary rotation sensor, when said malfunction detecting means detects malfunction of said main rotation sensor, and said connecting condition detecting means determines that the output shaft of the engine is substantially connected to said portion of the power transmission device; and

(h) second back-up calculating means for calculating the engine speed in accordance with the signal outputted from said operation condition detecting means and representing the condition of the operation of the actuator, when said malfunction detecting means detects malfunction of said main rotation sensor, and said connecting condition detecting means determines that the output shaft of the engine is substantially disconnected from said portion of the power transmission device.

4,984,456

DEVICE FOR DETECTING A MASS FLOW OF AIR FED INTO AN ENGINE CYLINDER

Hiroshi Takahashi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 18, 1989, Ser. No. 452,628

Claims priority, application Japan, Dec. 19, 1988, 63-320212

Int. Cl.[5] G01M *15/00*

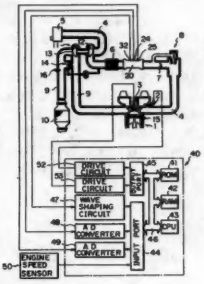
U.S. Cl. 73—118.2 **8 Claims**

1. A device for determining mass flow of air in an intake passage of an engine, which passage has a charger mounted therein, said device comprising:

air flow velocity detecting means arranged in the intake passage downstream of the charger to detect air flowing in the intake passage and to produce an output signal which represents, to a desired accuracy over a predetermined range of measurement, air flow velocity in the intake passage downstream of the charger;

a pressure sensor arranged in the intake passage downstream of the charger to detect a pressure in the intake passage and to produce an output signal representing the pressure in the intake passage;

a temperature sensor arranged in the intake passage downstream of the charger to detect a pressure in the intake passage and to produce an output signal which represents



the temperature of the air flowing in the intake passage; and

means for calculating mass flow of the air flowing in the intake passage on the basis of the signals output by said air flow velocity detecting means, said pressure sensor, and said temperature sensor.

4,984,457

TANK GAUGING APPARATUS AND METHOD

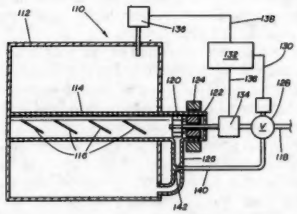
Brian G. Morris, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 396,726, Aug. 18, 1989, Pat. No. 4,956,996.

This application Feb. 28, 1990, Ser. No. 486,455

Int. Cl.[5] G01F *17/00*

U.S. Cl. 73—149 **5 Claims**



1. Apparatus for determining the amount of liquid in a container of liquid and gas at low or zero gravity net conditions, comprising:

a. an accumulator for receiving gas and a compressor for transporting gas from the container to the accumulator;

b. means for measuring the pressure and temperature of the gas in the accumulator;

c. means for measuring the pressure and temperature of the gas in the container;

d. means for selectively connecting the compressor and accumulator with the container; and

e. a separator for removing gas from the container, said separator comprising: a generally tubular member positioned at least partly within said container and providing means for gas to exit said container; an impeller positioned

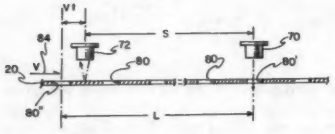
for imparting rotation to the liquid and gas within the tubular member to establish a vortex therein, whereby liquid may be urged radially outwardly from the center of the tubular member and gas may be communicated along the tubular member; and a fluid communication line extending from said tubular member for communicating gas outside of the container.

4,984,458

SYSTEM FOR MEASURING THE RELAXED LENGTH OF A MOVING WEB

Robert M. Montgomery, Indialantic, Fla.; Robert A. Dessert, and Dinesh G. Punater, both of Dayton, Ohio, assignors to A.M. International, Inc., Chicago, Ill.

Division of Ser. No. 418,047, Oct. 6, 1989, Pat. No. 4,947,685. This application Jun. 13, 1990, Ser. No. 537,966
Int. Cl.[5] G01B *11/04*
U.S. Cl. 73—159 **20 Claims**



1. A method of measuring the relaxed repeat length L_R of a web moving along a web path, comprising the steps of:
- forming a plurality of detectable marks along the length of the web, said marks being formed at a nominal repetitive length interval along the web:
- positioning along the web path first and second detectors separated by a known distance S, each sensitive to movement there past of one of said detectable marks;
- applying to the moving web a first tensioning force;
- measuring a first tensioned repeat length L_1 of said web by detecting with said first detector the movement of a mark there past, detecting with said second detector the next movement of a mark there past, and determining the time t_1 separating said detections;
- applying to the moving web a second tensioning force of a known proportional relationship X with respect to said first tensioning force;
- measuring a second tensioned repeat length L_2 of said web by detecting with said first detector the movement of a mark there past, detecting with said second detector the next movement of a mark there past, and determining the time t_2 separating said detections;
- measuring the speed of the moving web V; and
- calculating a relaxed repeat length from said first tensioned repeat length, said second tensioned repeat length, and said proportional relationship between said first and said second tensioning forces.

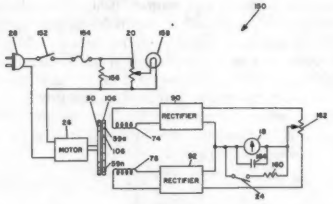
10. Apparatus for measuring the relaxed repeat length L_R of a moving web, comprising:
- a frame;
- path defining means connected to said frame for defining a web path;
- means for advancing the web along said web path;
- mark forming means for forming a plurality of detectable marks along the length of the web, said marks being formed at a nominal repetitive length interval along the web, whereby a nominal value for said relaxed repeat length may be selected such that said nominal relaxed repeat length is an integer multiple of said length interval;
- first and second detectors mounted to said frame and located along said web path, said detectors separated by a known distance S, each detector sensitive to movement there past of one of said detectable marks;
- means for alternatively applying to the moving web a first tensioning force and a second tensioning force of a known proportional relationship X;
- means for measuring the speed of the moving web V;
- control means connected to said first and second detectors, said tension applying means, and said web speed measuring means, said control means operating to:
  - cause said tension applying means to apply said first tensioning force to the moving web;
  - in response to detection by said first detector the movement of a mark there past, and detection by said second detector the next movement of a mark there past, measure the time t_1; separating said detections and calculate a first tensioned repeat length L_1;
  - cause said tension applying means to apply said second tensioning force to the moving web;
  - in response to detection by said first detector the movement of a mark there past, and detection by said second detector the next movement of a mark there past, measure the time t_2 separating said detections and calculate a second tensioned repeat length L_2; and
  - calculate a relaxed repeat length from said first tensioned repeat length, said second tensioned repeat length, and said proportional relationship between said first and said second tensioning forces.

4,984,459

RATE OF TURN INDICATOR

E. Paul Shannon, Rte. 2, Box 249, Killen, Ala. 35645

Filed Sep. 21, 1989, Ser. No. 410,285
Int. Cl.[5] G01C *19/06*
U.S. Cl. 73—178 R **1 Claim**



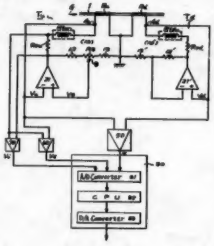
1. Rate of turn indicator for displaying a turn from a predetermined course comprising:
- a. a housing;
- b. a motor secured to said housing;
- c. a power means for powering said motor;
- d. a gyroscopic rotor mounted in said housing and about a plurality of spaced coils with respect to said gyroscopic rotor;
- e. a drive wheel means for indirectly and magnetically coupling said motor to said gyroscopic rotor; and,
- f. a signal processing means including a plurality of said coils for generating an induced current signal responsively coupled to said gyroscopic rotor for generating a rate of turn signal; and,
- g. a signal display means connected to said signal processing means for displaying a rate of turn signal to an operator.

4,984,460

MASS FLOWMETER

Yoritaka Isoda, Amagasaki, Japan, assignor to Lintec Co., Ltd., Shiga, Japan

Filed Dec. 7, 1988, Ser. No. 280,863
Claims priority, application Japan, Dec. 8, 1987, 62-310540
Int. Cl.[5] G01F 1/68
U.S. Cl. 73—204.15 3 Claims



1. A mass flowmeter comprising;
a pair of heat sensitive coils mounted at an upstream position and a downstream position of a conduit through which a fluid flows, said heat sensitive coils having resistance variable with temperature of said fluid,
an ambient temperature detecting resistor having approximately the same characteristics as and connected in series to each of said heat sensitive coils,
a temperature difference setting resistor having approximately zero temperature coefficient and connected in series to said ambient temperature detecting resistor,
each of said heat sensitive coils, said ambient temperature detecting resistor and said temperature difference setting resistor being included in one of separate, upstream and downstream constant temperature difference circuits, and
control means for controlling differences between temperatures of said heat sensitive coils and ambient temperature received from said constant temperature difference circuits to be approximately the same as a value set by said temperature difference setting resistor,
a mass flow rate of the fluid through said conduit being measured by detecting a difference in amounts of energy supplied to said heat sensitive coils.

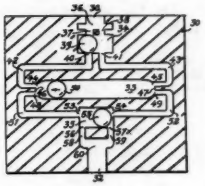
4,984,461

FLUID FLOW SENSOR

Joel E. Haynes, Tarzana, Calif., assignor to Alco Standard Corporation, Valley Forge, Pa.

Continuation of Ser. No. 914,466, Nov. 17, 1986, Pat. No. 4,802,362, which is a division of Ser. No. 790,595, Oct. 23, 1985, Pat. No. 4,635,476, which is a continuation of Ser. No. 589,592, Mar. 14, 1984, abandoned. This application Dec. 12, 1988, Ser. No. 283,219
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.[5] G01F 3/16
U.S. Cl. 73—249 8 Claims

1. In a fluid measuring device having an inlet and an outlet:
a measuring chamber having a member movable therein,
outlet control valve means including a chamber and a member movable between alternate connection positions, for connecting one or the other end of said measuring chamber to said outlet, said outlet control valve member operating solely in response to the pressure differential developed thereacross the valve member during movement of the movable member in the measuring chamber both to maintain said outlet control valve movable member at one or the other of its alternate connection positions and to move between the alternate connection positions, and
inlet control valve means including a chamber and a member movable between alternate connection positions, for alternately switching fluid flow from said inlet to one or the other end of said measuring chamber, the position of said inlet control valve member being both maintained at one or the other of its alternate connection positions and transferred between its alternate connection positions solely in response to pressure differential developed thereacross when said measuring chamber movable member reaches an end of said measuring chamber.

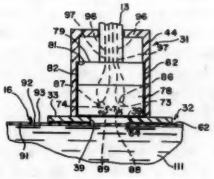


4,984,462

DETACHABLE LIQUID LEVEL MONITORING APPARATUS AND METHOD

Robert D. Hass, Jr., Corvalis, Oreg.; Brian G. Hodder, Briarwood, and Christopher P. Yakymyshyn, Ithaca, both of N.Y., assignors to Meditor Corporation, Briarwood, N.Y.

Filed May 30, 1989, Ser. No. 358,896
Int. Cl.[5] G01F 23/02; G01N 21/41
U.S. Cl. 73—293 19 Claims



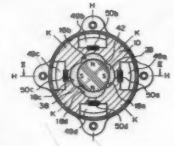
1. In a liquid level monitoring apparatus for monitoring the level of a liquid in a container having a wall with an exterior surface and an interior surface and formed of a material which is substantially transparent to optical energy and which has an index of refraction different from that of the liquid, a sensor holder, adhesive means adapted to secure said sensor holder to the exterior surface of the container at a predetermined level, a sensor head having liquid level sensing means therein, cooperative means carried by the sensor head and the sensor holder for detachably mounting said sensor head on said sensor holder and self-contained power supply means coupled to the sensor head.

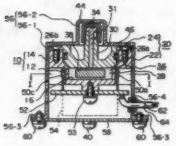
4,984,463

TWO-DIMENSIONAL ACCELERATION SENSOR

Takaharu Idogaki; Ikuo Hayashi, both of Okazaki; Toshihisa Ishihara, Nishio; Hideo Inoue, Ashigarakami, and Tatsuo Sugitani, Mishima, all of Japan, assignors to Nippon Soken, Inc. and Toyota Jidosha Kabushiki Kaisha, both of Toyota, Japan

Filed Sep. 26, 1989, Ser. No. 412,494
Claims priority, application Japan, Sep. 28, 1988, 63-243136; Feb. 3, 1989, 1-25994
Int. Cl.[5] G01P *15/08*
U.S. Cl. 73—516 R 11 Claims





1. A sensor for detecting an acceleration, comprising:

a housing made of a non-magnetic material and defining therein a chamber having a substantially tubular shape, said chamber defining a circumferential wall and axially spaced side walls;

a magnetic fluid stored in said tubular chamber;

a disk-shaped permanent magnet arranged in said tubular chamber, said disk magnet defining a circumferential outer wall and axially spaced side walls, and said disk magnet having angularly spaced pole portions which form a magnetic field adjacent thereto so that portions having a locally increased density of the magnetic fluid are formed adjacent to said pole portions along the circumferential outer wall and side walls of the disk magnet;

magnetic sensor means fixedly mounted on the housing for detecting changes in a magnetic flux from said pole portions of the disk magnet opposite to the sensor means, caused by a movement of the disk magnet relative to the housing;

said magnetic sensor means sensing a position of the disk magnet at which an inertia of the disk magnet generated by the acceleration is balanced by a magnetic viscous elastic force of the magnetic fluid caused by said locally increased portion of the magnetic fluid in the chamber between circumferential outer wall of the disk magnet and the circumferential wall of the chamber;

a spacing between the facing axially spaced side walls of the disk magnet and the chamber being such that axial movement of the disk magnet is substantially prevented, and:

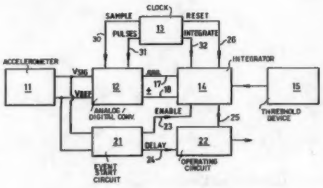
means for limiting movement of the disk magnet so that substantially only a kind of movement of the disk magnet relative to the housing in the plane of the disk magnet when an acceleration takes place can be obtained, thereby enabling a precise detection of a rate of the acceleration by the magnetic sensor means.

4,984,464

ACCELERATION RESPONSIVE CIRCUIT FOR ACTUANTINC VEHICLE EQUIPMENT

Alan D. Thomas, Reading, and Hoshmand Kalami, Cyncoed, both of Great Britain, assignors to First Inertia Switch Limited, Fleet, England

PCT No. PCT/GB88/00257, § 371 Date Oct. 13, 1989, § 102(e) Date Oct. 13, 1989, PCT Pub. No. WO88/07461, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 31, 1988, Ser. No. 424,205
Claims priority, application United Kingdom, Apr. 1, 1987, 8707754
Int. Cl.[5] G01P *15/08*; B60R *21/00, 21/32*; G08B *21/00*
U.S. Cl. 73—517 R 5 Claims



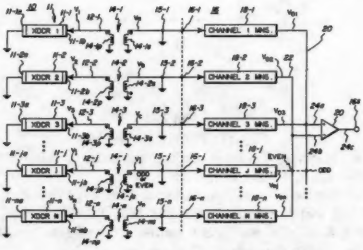
1. An acceleration responsive device comprising an electronic accelerometer providing an analog voltage output representative of acceleration detected and a reference voltage output representative of zero acceleration, an analogue/digital converter receiving the analogue and reference voltage outputs to digital signals and subtracting the digital signals from each other to provide resultant digital signal outputs and an integrator for integrating the resultant digital signals.

4,984,465

ULTRASOUND IMAGING SYSTEM WITH COMMON-MODE NOISE REJECTION PROBE

Joseph E. Piel, Jr., Scotia, and Lowell S. Smith, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 4, 1989, Ser. No. 445,521
Int. Cl.[5] G01N *29/04*
U.S. Cl. 73—602 10 Claims



1. An ultrasonic imaging system, comprising:

an even-numbered plurality N of transducers, each assigned to a like-numbered one of a plurality of channels;

a like plurality of signal transformers, each assigned to one of said channels and having a primary winding receiving a return signal from the associated channel transducer and a secondary winding, the polling of said secondary winding, with respect to said primary winding, alternating in sequential channels;

channel means for separately processing each secondary winding signal; and

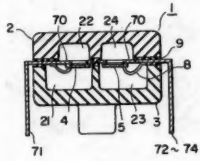
means for subtracting a sum of all processed signals for all even-numbered channels from a sum of all processed signals for all odd-numbered channels, to cause all transducer signals to be summed while undesired signals commonly present between said secondary windings and said subtractor means substantially cancel.

4,984,466

SEMICONDUCTOR PRESSURE SENSOR

Katsuaki Yasui; Yasuo Tada, and Akira Takashima, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1990, Ser. No. 531,428
Claims priority, application Japan, Jun. 2, 1989, 1-65133[U]
Int. Cl.[5] G01L 7/08, 9/06
U.S. Cl. 73—721 2 Claims



1. A semiconductor pressure sensor comprising:

first and second identical pressure sensing diaphragms each having first and second pressure receiving surfaces and supported to align in a common plane in the same orientation;

a housing including at least two parts connected by a bonding agent to define therein fluid passages in communication with said pressure sensing diaphragms; and

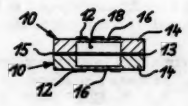
an electrically conductive support frame supporting said pressure sensing diaphragms and embedded within said bonding agent between two parts of said housing, said support frame including a support plate portion and terminal portions having inner ends embedded within the bonding agent and outer ends projecting outwardly of the bonding agent for external connections, said support frame being formed by cutting a lead frame having a support frame portion and terminal portions substantially along an outer contour of the housing except for the terminals.

4,984,467

TRANSDUCER FOR PRESSURES AND/OR VIBRATIONS AND METHOD FOR MANUFACTURING THEREOF

Hans W. Haefner, Aichach, Fed. Rep. of Germany, assignor to Pfister GmbH, Augsburg, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,142
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1988, 3808605; Apr. 30, 1988, 3814717
Int. Cl.[5] G01L 7/08, 9/06
U.S. Cl. 73—721 17 Claims



1. A pressure transducer comprising:

two rigid bodies, each being formed of non-creeping material with a ring-like shape around a central opening, and a radially extending plane end surface;

substantially plane diaphragms, each being formed integral to said rigid body and covering said opening at an end surface opposite to said plane end surface, said diaphragm having a thickness which is small as compared with that of said rigid body; and

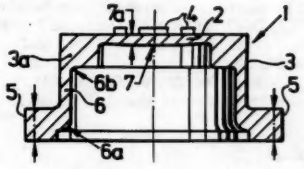
thickfilm resistor means applied to at least one of upper and lower surfaces of each of said diaphragms, wherein each of said two rigid bodies includes one of said diaphragms, and wherein said two rigid bodies are fixedly connected at plane end surfaces thereof forming a transducer unit with said thickfilm resistor means of each of said diaphragms being circuit connected.

4,984,468

PRESSURE SENSOR AND METHOD FOR MANUFACTURING IT

Hans W. Häfner, Aichach-Walchshofen, Fed. Rep. of Germany, assignor to Pfister GmbH, Augsburg, Fed. Rep. of Germany

Filed Feb. 23, 1990, Ser. No. 483,704
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1989, 3907202; Jun. 14, 1989, 3919411
Int. Cl.[5] G01L 7/08, 9/06
U.S. Cl. 73—727 19 Claims



1. A pressure sensor comprising:

a ceramic base of hat-like shape having in axial arrangement a stable clamping portion, a diaphragm support portion spaced from said clamping portion and a flexible transition portion connecting said clamping portion with said diaphragm support portion;

a ceramic diaphragm deformable in dependence on pressure applied thereto, formed unitary in said diaphragm support portion at a top surface thereof; and

transducer means applied to a main surface of said diaphragm for converting any deformation of said diaphragm into electric signals representing said pressure applied to said diaphragm.

4,984,469

AMPLITUDE MEASUREMENT DEVICE FOR VISCOELASTICITY ANALYSIS

Masafumi Take; Haruo Takeda, and Nobutaka Nakamura, all of Tokyo, Japan, assignors to Seiko Instruments, Inc., Chiba, Japan

Filed Nov. 16, 1989, Ser. No. 437,224
Claims priority, application Japan, Nov. 21, 1988, 63-294233
Int. Cl.[5] G01L 1/00
U.S. Cl. 73—770 2 Claims

1. An apparatus for providing an indication of the amplitude of a length signal having a top peak, a bottom peak and a center value, the length signal being indicative of the viscoelasticity of a sample, comprising:

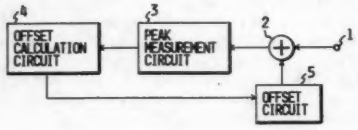
an offset circuit for providing a compensative offset signal;

an adder circuit connected for receiving the length signal and the compensative offset signal and for producing an output signal having a value representative of the sum of the length signal and the compensative offset signal;

a peak measurement circuit connected to receive the output

signal produced by said adder circuit for measuring the values of the top and bottom peaks of the output signal to determine the amplitude of the length signal; and

an offset calculation circuit connected for receiving the values of the output signal top and bottom peaks from said



peak measurement circuit and for supplying to said offset circuit a control signal effective to cause the offset signal provided by said offset circuit to have a value which compensates for deviations of the center value of the length signal from a desired value.

4,984,470

VORTEX-SHEDDING FLOWMETERS

Alan T. J. Hayward, 6 Woodside Gardens, Portishead, Bristol, Great Britain BS20 8EQ , and Terence Cousins, 15 Pealsham Gardens, Fordingbridge, Hampshire, Great Britain SP6 1AA

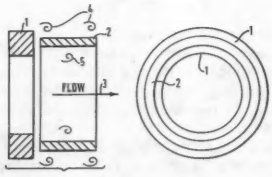
PCT No. PCT/GB87/00866, § 371 Date Aug. 7, 1989, § 102(e) Date Aug. 7, 1989, PCT Pub. No. WO88/04410, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 2, 1987, Ser. No. 375,017

Claims priority, application United Kingdom, Dec. 2, 1986, 8628747

Int. Cl.[5] G01F *1/32*

U.S. Cl. 73—861.22 **28 Claims**



1. A vortex-shedding flowmeter which comprises an annular or ring-shaped vortex-generating bluff body having inside and outside surfaces which generates two streams of vortices at said surfaces respectively, and a means downstream of the bluff body to provide a barrier between the two streams of vortices which at least delays mutual interference between them.

4,984,471

FORCE TRANSMITTING MECHANISM FOR A VORTEX FLOWMETER

William J. A. Storer, Loveland, Colo., assignor to Fisher Controls International, Inc., Clayton, Mo.

Filed Sep. 8, 1989, Ser. No. 404,602

Int. Cl.[5] G01F *1/32*

U.S. Cl. 73—861.24 **10 Claims**

1. In a vortex flowmeter having a housing and a passageway therethrough for conducting fluid in a passageway flow path and including a vortex generator in the passageway, the improvement comprising:

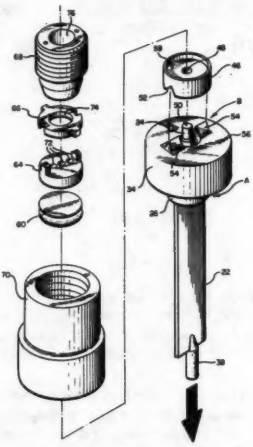
force sensing and transmission means for sensing vortex induced pressure differentials in said passageway flow path and transmitting the force generated by said vortex induced pressure differentials outside of said passageway, including a force sensing beam at one end, a force transmitting beam at the other end, and joining means therebetween;

said force sensing beam substantially disposed in said passageway flow path adjacent said vortex generator;

said force transmitting beam having one end projecting outside of said passageway;

said joining means including a plate with (1) a central portion fixed respectively on opposite sides thereof to one end of said force sensing beam and to the other end of said force transmitting beam and (2) outer edges fixed to the housing at said passageway, to form a first pivot point enabling rotational deflecton of said force sensing beam responsive to said vortex induces pressure differentials;

second pivot point means at said one end of said force transmitting beam projecting outside of said passageway to



form a second pivot point enabling rotational deflection of said force transmitting beam responsive to said rotational deflection of said force sensing beam;

said second pivot means includes a rocker member rigidly mounted to said one end of said force transmitting beam and rocker means fixed to said housing and engagingly contacting said rocker member to transform said rotational deflection of said force transmitting beam into a rocking deflection of said rocker member;

said rocker member includes V-shaped grooves engagingly contact mating with V-shaped projections on said rocker means; and

transducer means mounted at said second pivot point to detect said rotational deflection of said force transmitting beam corresponding to said vortex induced pressure differentials.

4,984,472

APPARATUS FOR MASS FLOW RATE AND DENSITY MEASUREMENT

Erik B. Dahlin, San Jose, Calif., assignor to Exac Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 775,739, Sep. 13, 1985, Pat. No. 4,711,132, which is a continuation-in-part of Ser. No. 616,808, Jun. 4, 1984, abandoned. This application Dec. 4, 1987, Ser. No. 128,954

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.[5] G01F *1/84*

U.S. Cl. 73—861.38 **6 Claims**

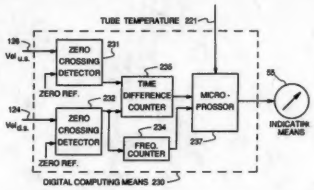
1. A flow meter for measuring the mass flow rate of a flow of material, comprising:

tubular conduit means arranged to receive, conduct and

discharge said flow of material and having an entrance portion, an exit portion, an actuated portion, a first detection portion coupling said entrance portion to said actuated portion, and a second detection portion coupling said actuated portion to said exit portion;

actuating means coupled to said actuated portion for applying forces causing said actuated portion to oscillate between positions on opposite sides of a rest position;

detecting means including first velocity sensor means coupled between said first detection portion and a reference, and including second velocity sensor means coupled between said second detection portion and a reference, said first and second velocity sensor means respectively producing first and second velocity signals indicative of the relative velocities of the corresponding detection portions;



means for measuring the temperature of said conduit means and for developing a temperature signal commensurate therewith; and

computing and indicating means responsive to said velocity and temperature signals and operative to calculate and indicate the mass flow rate of the flow of material through said tubular conduit means using the formula

$$F_{mass} = \frac{\tan \frac{\Delta\theta}{2}}{2KRw_D\left(\sin\theta - \cos\theta \tan\frac{\Delta\theta}{2}\right)}$$

where

$\Delta\theta$ is the phase angle difference between zero values of output signals developed by said first and second velocity sensor means;

$$\theta = \frac{\pi}{2} - \arctan\frac{(2z_c W_D)}{w_c^2 - w_D^2};$$

K is a variable computed from measurement of the flow tube temperature;

$$R = \frac{w_c^2}{\sqrt{(w_c^2 - w_D^2)^2 + 4z_c^2 w_D^2}};$$

W_D is the natural frequency of the tubular conduit means in a drive mode;

W_C is the actual natural frequency of the tubular conduit means in a Coriolis mode; and

Z_C is the actual damping coefficient for the Coriolis mode.

4,984,473

TORQUE MONITOR

Eric Von Stoutenborough, and David J. Lang, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 28, 1989, Ser. No. 386,260

Int. Cl.[5] G01L *3/14*

U.S. Cl. 73—862.19 **12 Claims**

12. A torque monitor comprising:

a housing;

a hollow shaft journalled for rotation in said housing and having an internal, axial spline;

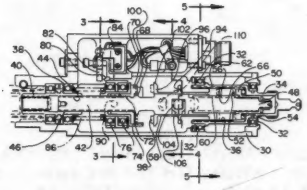
a sleeve having an external spline disposed within said hollow shaft for axial movement relative thereto with said splines engaged to prevent relative rotation, said sleeve having an internal thread;

an additional shaft having an external thread disposed within and threaded to said sleeve and being journalled for rotation within said housing;

an actuator mounted on said additional shaft for axial movement thereon;

a shoulder on said additional shaft for driving said actuator axially in one direction upon axial movement of said additional shaft in said one direction and engagement of said shoulder with said actuator;

a switch mounted in the path of movement of said actuator so as to be trippable thereby;



a shoulder on said sleeve radially outward of said shoulder on said additional shaft for driving said actuator axially upon axial movement of said sleeve in said one direction and engagement of said sleeve shoulder with said actuator;

a first set of teeth on said sleeve shoulder and said actuator and engagable to prevent relative rotation between said sleeve and said additional shaft upon predetermined movement of said sleeve in said one direction;

a second set of teeth on said sleeve and said additional shaft and engagable to prevent relative rotation between said sleeve and said additional shaft upon predetermined movement of said additional shaft in said one direction;

a plunger carried by said additional shaft;

a spring biasing said plunger in the radial direction; and

first and second axially spaced slots in said sleeve and respectively located to receive said plunger upon engagement of the teeth of said first and second sets.

4,984,474

TORQUE SENSOR

Jun Matsushima; Tetsuto Kageyama; Shigekazu Nakamura, and Kenji Wakazono, all of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Sep. 27, 1989, Ser. No. 413,306

Claims priority, application Japan, Sep. 30, 1988, 63-244454; Nov. 24, 1988, 63-294588; Dec. 16, 1988, 63-316512; Sep. 19, 1989, 1-108584[U]

Int. Cl.[5] G01L *3/10*; G01B *7/14*

U.S. Cl. 73—862.33 **15 Claims**

1. A torque sensor comprising:

a first shaft supported for rotation about its axis in a casing;

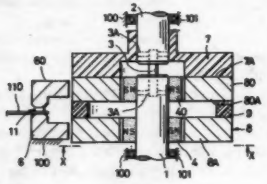
an annular permanent magnet, magnetized with a multiplicity of poles, and secured to said first shaft;

a second shaft supported for rotation about its axis in said casing and disposed in end-to-end relationship to said first shaft;

connecting means for connecting said first shaft and said second shaft;

a magnetic core secured to said second shaft, said annular permanent magnet being rotatably displaceable relative to said magnetic core to cause a magnetic flux variation; and

a magnetism sensor secured to said casing and sandwiched between magnetic members disposed in the vicinity of an outer peripheral face of said magnetic core,



said magnetism sensor for detecting from said magnetic flux variation a direction of displacement and an amount of displacement of said first shaft relative to said second shaft.

4,984,475

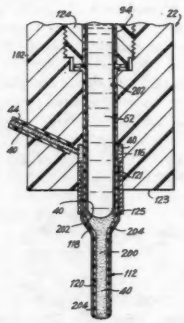
ULTRA LOW CARRYOVER SAMPLE LIQUID ANALYSIS APPARATUS AND METHOD

Kenneth F. Uffenheimer, Mahopac; Nicholas F. Di Domenico, Pine Bush, both of N.Y., and Stephen L. Weitz, Alameda, Calif., assignors to Tritech Partners, Tarrytown, N.Y.

Filed Jul. 24, 1989, Ser. No. 384,742

Int. Cl.[5] G01N *35/06*

U.S. Cl. 73—864.22 22 Claims



1. In sample liquid analysis system for the analysis of successive sample liquids comprising sample liquid aspiration and dispensing probe means, and means operatively associated with said sample liquid probe means for coating the interior and exterior walls thereof with an isolation liquid which is immiscible with said sample liquids and which preferentially wets the interior and exterior probe means walls to the substantial exclusion of said sample liquids, the improvements comprising, means operatively associated with said sample liquid probe means for aspirating a sample liquid segment thereinto, and for subsequently dispensing said sample liquid segment therefrom, and means operatively associated with said sample liquid probe means for subsequently flowing a rinse liquid which is miscible with said sample liquids but immiscible with said isolation liquid through said probe means to remove aspirated sample liquid residue therefrom, thereby reducing sample liquid carryover upon the aspiration by said sample liquid probe means of a succeeding sample liquid thereinto.

4,984,476

AIR CONVEYOR FOR GAS-SAMPLING TUBES

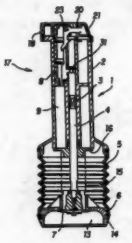
Klaus D. Dahrendorf, and Ulrich Noack, both of Berlin, Fed. Rep. of Germany, assignors to Auergesellschaft GmbH, Fed. Rep. of Germany

Filed Oct. 19, 1989, Ser. No. 423,937

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1988, 3835885

Int. Cl.[5] G01N *1/24*

U.S. Cl. 73—864.35 10 Claims



1. An air conveyor for a gas-sampling tube used for detecting foreign material suspended in air comprising: a body serving as a handle; a control rod having a free end, guided and lockable in a through-duct running through the body; the control rod connected opposite the free end to a piston of a suction bellows, the bellows including an air outlet valve in the piston; a sealing insert disposed at an end of the body opposite the bellows for receiving the gas-sampling tube; and a locking and releasing mechanism comprising:

(a) two lever linkages, each provided with a hook, which are pivotally disposed in the body one under the other and parallel to the control rod; and

(b) the free end of the control rod having at least one recess therein that is in operative connection with at least one hook of the lever linkages for lockably securing the control rod in position at the beginning and at the end of a suction stroke, the control rod being releaseable to initiate the suction stroke of the bellows by pressing a push-button connected to one of the linkages.

4,984,477

DRIVING DEVICE

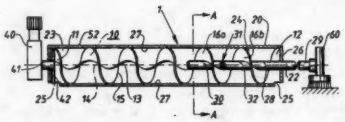
Richard Bruke, Bunkeflostrand, Sweden, assignor to Spirac Engineering AB, Malmo, Sweden

Filed Feb. 27, 1989, Ser. No. 316,290

Claims priority, application Sweden, Feb. 29, 1988, 8800702

Int. Cl.[5] F16H *25/24*

U.S. Cl. 74—89.15 15 Claims



1. A driving device for producing substantially linear movement of a driver, said driver device comprising a shaftless spiral rotatable around a longitudinal axis and having opposite first and second end regions each corresponding to an end of the spiral, said shaftless spiral comprising a flat element spirally wound around said longitudinal axis and defining a succession of radial turns having a determined pitch and defining inner and outer limiting surfaces, a sliding body supported in enclosed relation within the inner limiting surface of said shaftless

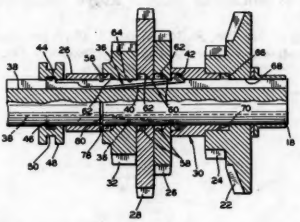
spiral with capability of axial movement relative to said spiral, a projecting element on said sliding body extending between two adjoining turns of said spiral with little axial play, means co-operating with said sliding body to limit rotational movement thereof during rotation of the spiral, said sliding body comprising an elongated portion extending in the axial direction of the spiral and on which the inner limiting surface of said spiral is fitted with little radial play, said elongated element constituting a driver which upon rotation of the spiral is moved substantially in the direction of the longitudinal axis of the shaftless spiral.

4,984,478

GEAR DRIVE UNIT WITH EQUALIZED SHIFT

Paul A. Crawford, and James E. Hall, both of Mt. Vernon, Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Jul. 31, 1989, Ser. No. 387,655
Int. Cl.[5] F16H *3/08*
U.S. Cl. 74—372 **13 Claims**



1. A gear drive unit comprising a shaft, a shift key mounted on said shaft for longitudinal movement with respect to said shaft, a first gear rotatably mounted on said shaft, a second gear rotatably mounted on said shaft and spaced from said first gear, said second gear having means for receiving said shift key to enable said second gear to rotate with said shaft, a shift coupling on said shaft and extending from said first gear toward said second gear and rotatable with said first gear, said coupling having means for receiving said shift key to enable said coupling and said first gear to rotate with said shaft, said coupling being separate from said first gear, said first gear and said coupling having engaging means to enable said coupling to rotate with said first gear.

4,984,479

CONTROL SYSTEM FOR A SNOW BLOWER TRACTION VEHICLE

Wayne Phillips, McDonough, Ga., assignor to Fuqua Industries, Inc. (Snapper Division), McDonough, Ga.

Filed May 4, 1990, Ser. No. 519,437
Int. Cl.[5] G05G *9/08*
U.S. Cl. 74—480 R **9 Claims**

1. In a power driven traction vehicle having a tool operated therewith, a hand control system comprising,

a wheel drive connecting means,

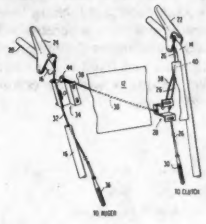
a tool drive connecting means,

a first hand control means connected to said wheel drive connecting means and movable between an operable and inoperable position,

a second hand control means connected to said tool drive connecting means and movable between an operable and inoperable position

an auxiliary control means responsive to said first hand control means, and

said auxiliary control means having a retaining means for retaining said second hand control means in its operable position in response to said first hand control means being moved to its operable position and releasing said second



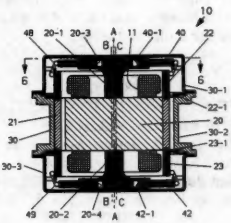
hand control means in response to said first hand control means being moved to its inoperable position.

4,984,480

ROLLING ROTOR MOTOR BALANCING MEANS

Thomas P. Gormley, St. Louis, Mo., and James F. Crofoot, Kirkville, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 14, 1989, Ser. No. 450,495
Int. Cl.[5] F16F *15/22*; H02K *5/24*
U.S. Cl. 74—573 R **10 Claims**



1. A rolling rotor motor means comprising:

housing means;

stator means within said housing means and having an axis and a plurality of selectively activated windings;

annular rotor means within said housing means and having a center of gravity and surrounding said stator means so as to coact therewith such that when some of said windings are activated said rotor means is in line contact with said stator means;

counterweight means having a center of gravity and movably located within said housing means; and

linkage means connecting said rotor means and said counterweight means such that said center of gravity of said rotor means and said center of gravity of said counterweight means are maintained 180 out of phase with respect to said axis of said stator means so as to provide a dynamic balance.

4,984,481

AUTOMOTIVE ANTI-THEFT STEERING LOCK

Claude Jawdoszyn, Sannois, France, assignor to Neiman, Courbevoie, France

Filed Dec. 20, 1988, Ser. No. 286,791
Claims priority, application France, Dec. 21, 1987, 87 17808
Int. Cl.[5] G05G *1/00, 5/06*
U.S. Cl. 74—577 S **2 Claims**

1. A two lever anti-theft steering lock for an automotive vehicle having a steering shaft, said lock comprising:

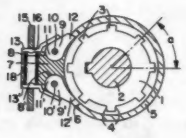
a sleeve to be fixed to the steering shaft, substantially radial teeth being provided on said sleeve,

two locking levers each having a pointed tip,

a fixed latch support having cradle portions formed therein,

means freely pivoting each said locking lever in a respective one of said cradle portions whereby to bear against the latter, each said pivot means defining a pivot axis parallel to the steering shaft and fixed to said latch support,

a control bracket having a window comprising a narrow zone and a wide zone,



second end portions of said locking levers, at ends thereof opposite from said pointed tips, cooperating with said window so as to be urged towards each other when in said narrow zone of said window by contact with edges of said bracket defining said narrow zone, and so that in said wide zone thereof said second ends are no longer in contact with said bracket, and

the angular spacing between said pointed tips of said locking levers being slightly smaller than the angular spacing between two successive said teeth of said locking sleeve or a whole number multiple thereof.

4,984,482

DRIVE POWER TRANSMISSION MECHANISM FOR MOTOR VEHICLES

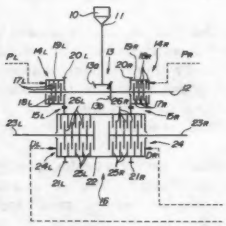
Yasuji Shibahata, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1989, Ser. No. 376,061

Claims priority, application Japan, Jul. 8, 1988, 63-90641[U]

Int. Cl.[5] F16H *35/04*

U.S. Cl. 74—650 **6 Claims**



1. A drive power transmission mechanism in a motor vehicle having a drive power source, comprising:

a propeller shaft having a front end coupled to the drive power source;

a bevel gear mechanism;

an intermediate shaft extending transversely to said propeller shaft and operatively coupled to a rear end of the propeller shaft through said bevel gear mechanism;

a spur gear mechanism; and

a final speed reducer operatively coupled to said intermediate shaft through said spur gear mechanism;

wherein said final speed reducer comprises a differential including a pair of lateral coaxial output shafts extending parallel to said intermediate shaft and coupled to respective drive road wheels of the motor vehicle, a differential case disposed coaxially around said output shafts, a plurality of outer plates mounted on inner peripheral wall surfaces of said differential case for rotation with and axial movement on the differential case, a plurality of inner plates axially alternating with said outer plates and mounted on said output shafts for rotation with and axial movement on the output shafts, so that said output shafts can rotate differentially depending on a hydraulic pressure acting adjustably on said inner and outer plates, and wherein said spur gear mechanism comprises at least one spur gear set including a first spur gear disposed coaxially on said intermediate shaft and a second spur gear fixedly mounted coaxially on an outer peripheral wall surface of said differential case and meshing with said first spur gear at a predetermined gear ratio.

4,984,483

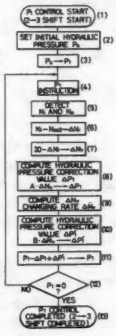
CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION OF A MOTOR VEHICLE

Takeo Hiramatsu, and Yuichi Tanaka, both of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 38,340, Apr. 15, 1987, abandoned. This application May 19, 1989, Ser. No. 357,640

Int. Cl.[5] B60K *41/12*

U.S. Cl. 74—866 **6 Claims**



1. A control system for an automatic transmission of a motor vehicle of the type having, an input shaft supplied with a drive force, first and second engaging elements capable of selecting gear ratios between said input shaft and an output shaft, a control device engaging element change-over means for engaging said first engaging element and releasing said second engaging element to accomplish a shift from a first speed ratio to a second speed ratio, a control means for controlling engaging forces of said engaging elements during the shift, and an instruction means for generating an instruction signal to start the shift, further including:

said control means having a detecting means for detecting an effective shift started by engaging said first engaging element;

a rotation speed detecting means for detecting rotational speed of said input shaft;

a first engaging force control means for controlling engaging force of said second engaging element according to generation of said instruction signal so as to regulate rotation speed of said input shaft to be equal to a predetermined reference rotational speed higher by a predetermined value than rotation speed before generation of said instruction signal; and,

a second engaging force control means for starting engagement of said first engaging element according to generation of said instruction signal and, after said detecting

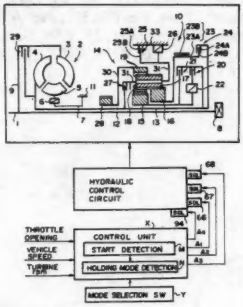
means detects start of an effective shift, controlling engaging force of said first engaging element at a desired value.

4,984,484

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Takuji Fujiwara; Hiroshi Yoshimura; Kozo Ishii, and Kazuo Takemoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Shinchi, Japan

Filed Sep. 28, 1989, Ser. No. 413,972
Claims priority, application Japan, Sep. 30, 1988, 63-246253
Int. Cl.[5] B60K *41/18*
U.S. Cl. 74—866 **4 Claims**



1. A hydraulic control system for an automatic transmission of a vehicle which has a transmission gear mechanism having at least a lower gear-speed and a higher gear-speed, and first and second friction coupling members which are applied or released by hydraulic pressures applied thereto, the first friction coupling member being kept applied when the transmission is in the lower gear speed and the second friction coupling member being kept applied when the transmission is in the higher gear-speed, the control system including a hydraulic control circuit which controls the hydraulic pressure applied to the respective friction coupling members, thereby changing the condition of application of the friction coupling members and causing the automatic transmission to shift and a control means which controls the hydraulic control circuit according to the running condition of the vehicle, characterized in that

said control means includes an application pressure changing means which makes lower the hydraulic pressure applied to the second friction coupling member when it is kept applied than that applied to the first friction coupling member when it is kept applied by a predetermined value,

a detecting means which detects that the vehicle is starting with the transmission in the higher gear-speed, and

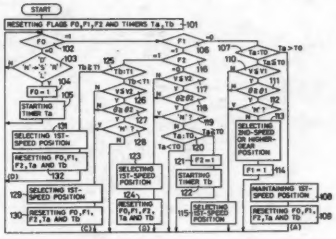
an inhibiting means which inhibits the application pressure changing means from making lower the hydraulic pressure applied to the second friction coupling member when it is kept applied than that applied to the first friction coupling member when it is kept applied when the detecting means detects that the vehicle is starting with the transmission in the higher gear-speed.

4,984,485

APPARATUS AND METHOD FOR CONTROLLING AUTOMATIC TRANSMISSION FOR MOTOR VEHICLE, WITH ANTI-SQUAT SHIFTING ARRANGEMENT

Masahiro Kojima, Toyota; Seiichi Nishikawa, Toyokawa, and Nobuaki Takahashi, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 23, 1989, Ser. No. 371,560
Claims priority, application Japan, Jul. 8, 1988, 63-170211
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—866 **11 Claims**



1. A method of controlling an automatic transmission for a motor vehicle with an engine, wherein the transmission has a plurality of selectively established gear positions including a lowest-gear position, and is shifted and temporarily held in a predetermined one of the gear positions other than the lowest-gear position, upon an operation of an operator-controlled shifting member from a neutral position to one of drive positions, to effect an anti-square shifting of the transmission in response to the operation of the shifting member, so as to reduce a shifting shock of the transmission and avoid a squatting of the vehicle, comprising the steps of:

detecting an operation of said shifting member from said neutral position to one of said drive positions;

determining whether at least one condition for effecting said anti-squat shifting has been satisfied within a predetermined first time period after said operation of said shifting member or not, said at least one condition including an engine output condition that a currently required output of said engine is equal to or larger than a predetermined reference value which is higher than a value corresponding to an idling condition of said engine; and

if all of said at least one conditions are determined to have been satisfied within said first time period, commanding said transmission to be shifted to said predetermined one gear position.

4,984,486

HYDRAULIC PRESSURE CONTROL DEVICE FOR AUTOMATIC TRANSMISSION FOR VEHICLE INCLUDING REVERSE STAGE PREVENTION SYSTEM

Mitsuru Takada; Hiroshi Itoh, both of Toyota, and Tokuyuki Takahashi, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jan. 27, 1989, Ser. No. 302,256
Claims priority, application Japan, Feb. 18, 1988, 63-36336
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—868 **5 Claims**

1. A hydraulic pressure control device for an automatic transmission for a vehicle, comprising:

a manual shift valve for selecting a forward range in which at least one forward speed stage is enabled and a reverse range in which a reverse stage is enabled;

a reverse stage disabling valve having a spool element shiftable between a first shift position and a second shift position opposite said to first shift position, a spring for biasing said spool element to said first shift position, and a first

control signal port for receiving a first signal hydraulic pressure to bias said spool element away from said first shift position toward said second shift position and a second control signal port for receiving a second signal hydraulic pressure to bias said spool element away from said second shift position toward said first shift position to selectively permit or interrupt transmission of a hydraulic pressure for setting up the reverse stage according to the shifting of said spool element to said first shift position or said second shift position, respectively; and

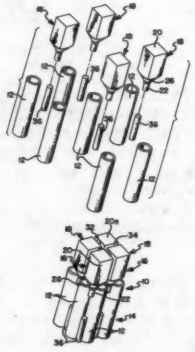
a hydraulic pressure control circuit for controlling supply and non-supply of said first and said second signal hydraulic pressure to said first and said second control signal port, respectively, so as to supply said first signal hydraulic pressure to said first control signal port and not to supply said second signal hydraulic pressure to said second control signal port when said manual shift valve is set to the reverse range, although the reverse stage is to be prevented, and to supply said second hydraulic pressure to said second control signal port when the manual shift valve is set to the forward range, wherein upon failure of said hydraulic pressure control circuit said spool element is maintained at said first position thereby not disabling the reverse stage.

4,984,487

METHOD FOR MANUFACTURING A DIE FOR EXTRUDING HONEYCOMB MATERIAL

Richard F. Beckmeyer, Clarkston, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 24, 1989, Ser. No. 397,936
Int. Cl.[5] B21C *25/10*; B23P *15/24*
U.S. Cl. 76—107.1 **7 Claims**



1. A method of making a die for extruding honeycomb structure, the die having a plurality of feed holes, an extrusion slot pattern and a transition path for directing extrudant from the feed holes through the extrusion slot pattern to form the shape of a honeycombed body comprising the steps of:

stacking a plurality of individual tubes in spaced parallelism to form a loose tube stack having a plurality of spaced parallel feed holes;

providing a plurality of individual shaping teeth, each having a head portion and a shank portion;

fixturing each of said shaping teeth with respect to the other shaping teeth for providing accurate spacing between the head portions thereof for forming intersecting rows of extrusion slots; and

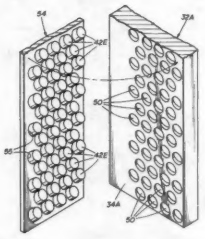
inserting the shank portions of the fixtured shaping teeth into said loose tube stack to produce accurate alignment of the shaping teeth with respect to the feed holes while conforming the intersecting rows of extrusion slots with the feed holes by adjusting the loose tube elements with respect to the fixtured shaping teeth.

4,984,488

METHOD OF SECURING CUTTING ELEMENTS ON CUTTING TOOL BLADE

Gerald D. Lunde, and Harold H. Harvey, Jr., both of Bossier City, La., assignors to Tri-State Oil Tools, Inc., Bossier City, La.

Division of Ser. No. 181,812, Apr. 15, 1988, which is a continuation-in-part of Ser. No. 816,287, Jan. 6, 1986, Pat. No. 4,796,709. This application Apr. 23, 1990, Ser. No. 512,973
Int. Cl.[5] B21K *5/12*
U.S. Cl. 76—115 **3 Claims**



1. A method of securing a plurality of cutting elements at precise positions on a generally planar surface of a blade adapted to be mounted on a cutting tool for cutting previously existing casing in a well bore and comprising the following steps:

making the planar surface of the blade with a separate mark for each separate cutting element;

preassembling in a template all of the cutting elements for the blade in a predetermined pattern identified by the marks on the blades;

placing the preassembled cutting elements on the blade with each cutting element positioned precisely thereon with respect to its respective mark; and

then brazing the cutting elements onto the surface of the blade for securing the cutting elements thereon in precise relation to each other.

4,984,489

WINDOW HANDLE TURNING ACCESSORY

Martin Krauthamer, 65 Beverly Rd., Great Neck, N.Y. 11021

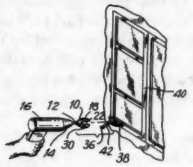
Continuation of Ser. No. 320,698, Mar. 8, 1989, abandoned. This application Oct. 13, 1989, Ser. No. 421,134
Int. Cl.[5] B25B *13/00*
U.S. Cl. 81—124.2 **5 Claims**

1. An accessory for a hand drill for facilitating turning of a crank handle of the opening mechanism for a casement-type window, the crank handle having a cylindrical connection

portion and a lateral extension connected thereto, said lateral extension being smaller in width than the diameter of said cylindrical connection portion the accessory comprising:

(a) a hand drill connection means for removably connecting the accessory to a hand drill and for transmitting the torque power of said hand drill to said accessory and;

(b) a head end connected to said hand drill connection means adapted to contact and rotate said crank handle when said



hand drill connection means is rotated by said hand drill; said head end being provided with a central cavity having a laterally extending opening, said central cavity adapted to fit over said cylindrical connection portion and said laterally extending opening being wide enough to allow said lateral extension of said crank handle to pass therethrough, and said laterally extending opening being at least as wide as said cylindrical connection portion of said crank handle.

4,984,490

METHOD AND APPARATUS FOR ADJUSTING THE CUTTING KNIFE CLEARANCE IN SHEET CUTTERS

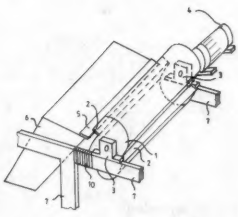
Jarmo Kurki, Karhula, Finland, assignor to Valmet-Ahlstrom, Inc., Karhula, Finland

Filed Dec. 7, 1988, Ser. No. 280,897

Claims priority, application Finland, Dec. 9, 1987, 875423

Int. Cl.[5] B26D *7/26*

U.S. Cl. 83—13 **13 Claims**



1. A method for controlling clearance between knives in a sheet cutter comprising a cutter drum that is provided with a cutting knife that is driven to rotate, and a stationary knife support provided with a counter knife, the clearance between the cutting knife and the counter knife being adjustable, said method comprising the steps of:

(a) detecting at least one of a tangential force resisting movement of the knife past the counter knife and a radial force tending to separate the cutting knife from the counter knife,

(b) deriving a signal from the detected force, and

(c) employing such signal as a command variable to adjust the clearance between the cutting knife and the counter knife.

4,984,491

ROTARY CUTTING HEAD, PARTICULARLY FOR TOBACCO CUTTING MACHINES

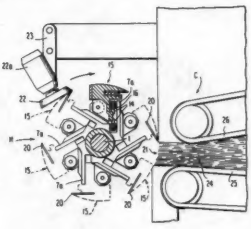
Giorgio Bragaglia, Bologna, Italy, assignor to Comas S.p.A., Treviso, Italy

PCT No. PCT/EP87/00075, § 371 Date Aug. 15, 1988, § 102(e) Date Aug. 15, 1988, PCT Pub. No. WO87/04905, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 19, 1987, Ser. No. 255,164

Int. Cl.[5] A24B *7/12*; B26D *1/86*

U.S. Cl. 83—338 **4 Claims**



1. A cutting device, particularly for cutting a block of tobacco leaving a supply device, comprising:

a support and guide structure supported so as to be rotatable about an axis lying at an angle to the direction of advance of the block of tobacco;

a plurality of movable blade-carrier elements mounted on said support and guide structure with each element carrying a cutting blade adapted to intersect and penetrate the block of tobacco leaving the supply device; each blade-carrier element and associated blade being movable axially relative to the said support and guide structure independently of each other;

drive means for rotating the guide and support structure, and control means for sequentially effecting an axial reciprocating translational movement of each blade-carrier element in synchronism with a revolution of the support and guide structure during the cutting of the block of tobacco;

the control means including a stationary cam member having a shaped drive profile; each blade-carrier element having a respective feeler member cooperating with said drive profile, and thrust means carried by said structure for urging each feeler against said drive profile of the cam member.

4,984,492

CUTTING BLADE AND METHOD FOR CUTTING SHEET MATERIAL

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., West Tolland, Conn.

Filed Jun. 23, 1989, Ser. No. 370,623

Int. Cl.[5] D06H *7/00*

U.S. Cl. 83—697 **4 Claims**

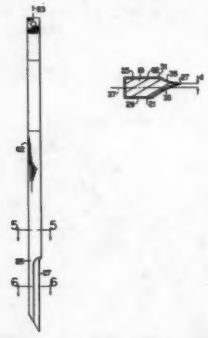
1. A blade for a sheet material cutting machine, said blade prior to use comprising:

a piece of base material having an elongated cutting portion extending along a longitudinal axis and having a forward cutting edge parallel to said longitudinal axis,

said cutting portion having two generally flat rear side faces located respectively in first and second spaced parallel planes and which side faces are located rearwardly of said cutting edge, and first and second forward side surfaces, said first and second forward side surfaces each extending forwardly from a respective one of said rear side faces and said first and second forward side surfaces being inclined relative to one another, as seen in a plane perpendicular to said longitudinal axis, and intersecting one another to define said cutting edge at their line of intersection,

said cutting edge being located between said first and second planes and being laterally displaced from a reference plane located parallel to and mid-way between said first and second planes so that said first forward side surface passes through said reference plane, and

a thin coating of hard material harder than said base material covering at least said first forward side surface of said



cutting portion of said base material so that by a sharpening grinding of said second side surface said cutting edge can be made to be defined substantially entirely by said hard material, and whereby as a result of repeated sharpening grindings of said second side surface said cutting edge gradually moves toward and eventually to the other side of said reference plane.

4,984,493

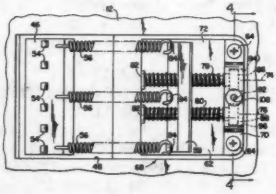
ADJUSTABLE COUNTER-TENSIONING MECHANISM FOR STRINGED INSTRUMENT TREMOLO DEVICE

Helmut F. K. Schaller, Kuckucksweg 16, 8501, Feucht, Fed. Rep. of Germany

Filed May 11, 1990, Ser. No. 522,160

Int. Cl.[5] G10D *3/00*

U.S. Cl. 84—313 **8 Claims**



1. An adjustable counter-tensioning mechanism for use with a stringed musical instrument having a body with a top surface, parallel strings extending over said top surface, a tremolo device having a string anchor pivotal about an axis generally perpendicular to said strings and parallel to the instrument top and also having a rear portion extending rearwardly into a recess in said instrument body, said strings being anchored to said string anchor and tending to rotate it in one direction about said tremolo axis, and at least one spring connected to said rear portion of said string anchor tending to rotate said string anchor in the opposite direction about said tremolo axis, said counter-tensioning mechanism comprising:

a base adapted for fixed attachment to said body of said stringed instrument,

first and second gears carried by said base for rotation relative thereto about spaced first and second parallel axes,

a third gear carried by said base for rotation relative thereto about a third axis and drivingly connected with said first and second gears so that when said third gear is rotated about said third axis said first and second gears rotate in opposite directions about said first and second parallel axes,

two threaded shafts each connected to a respective one of said first and second gears for rotation with said first and second gears about said parallel axes, and

a spring anchor threadably received by said two threaded shafts so as to be moved in one direction or another relative to said base along said parallel axes in response to rotation of said third gear in one direction or another about said third axis,

said spring anchor including means for fastening thereto one end of said at least one spring another end which is fastened to said rear portion of said string anchor.

4,984,494

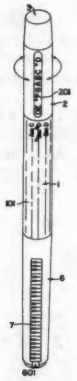
TUNING PEN

Ming-Jer Yang, 7F, 58 Kuangming Street, Panchiao Taipei Hsien, Taiwan

Filed Oct. 23, 1989, Ser. No. 425,249

Int. Cl.[5] G10G *1/04*

U.S. Cl. 84—474 **1 Claim**



1. A tuning pen comprising:

a writing implement holder comprising a first cylinder having a larger diameter and a second cylinder having a smaller diameter, said first and second cylinders being connected end-to-end, said first cylinder having musical key signatures indicated around its circumference, said second cylinder having thereon notes corresponding to each musical key signature adjacent to the musical key signature on the first cylinder;

a sleeve having a greater diameter than said second cylinder, said sleeve being coaxial with and rotatable around said second cylinder, said sleeve having an aperture through which the notes corresponding to one musical key signature can be viewed; and

a tuning flute which is positioned at one end of said writing implement holder.

4,984,495

MUSICAL TONE SIGNAL GENERATING APPARATUS

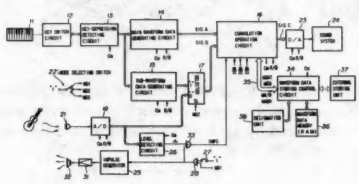
Junichi Fujimori, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed May 9, 1989, Ser. No. 350,107

Claims priority, application Japan, May 10, 1988, 63-112891

Int. Cl.[5] G10H *1/02, 7/00*

U.S. Cl. 84—603 **9 Claims**



1. A musical tone signal generating apparatus, comprising:

(a) data generating means for generating musical tone waveform data in lapse of time, said musical tone waveform data consisting of first sampling data indicative of instantaneous amplitude values of a continuous musical tone waveform;

(b) first storing means for delaying said first sampling data outputted from said data generating means, so that said first storing means stores delayed first sampling data therein;

(c) acoustic converting means for converting an acoustic signal into an analog signal, wherein said acoustic signal indicates acoustics of an externally picked-up musical tone;

(d) analog-to-digital converting means for converting instantaneous values of said analog signal into a digital signal;

(e) second storing means for storing said digital signal as second sampling data indicative of said externally picked-up musical tone;

(f) multiplying means for multiplying each of said delayed first sampling data and each of said second sampling data together; and

(g) combining means for combining output data of said multiplying means together to thereby form an output musical tone waveform, said output musical tone waveform being outputted from said combining means as output sampling data indicative of instantaneous amplitude values thereof.

4,984,496

APPARATUS FOR DERIVING AND REPLICATING COMPLEX MUSICAL TONES

Dwight A. Beacham, East Texas; Robert P. Woron, Allentown, and John T. Whitefield, Harleysville, all of Pa., assignors to Allen Organ Company, Macungie, Pa.

Division of Ser. No. 94,005, Sep. 8, 1987, Pat. No. 4,905,562.

This application Nov. 6, 1989, Ser. No. 432,137

Int. Cl.[5] G10H *7/00, 1/02, 1/08*

U.S. Cl. 84—625 **22 Claims**

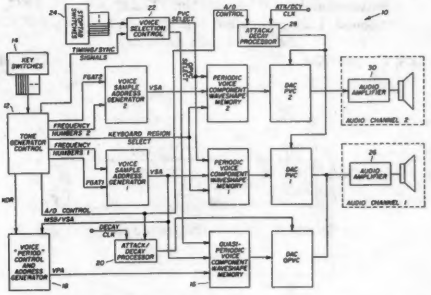
1. In an electronic musical instrument having a keyboard for allowing the production of sounds corresponding to selected voices at pitches corresponding to respective notes of a musical scale as indicated by depressed keys, apparatus for replicating compound voice waveforms spanning the transient and steady-state portions of the selectable voices comprising:

means for storing the quasi-periodic component waveforms of the selected voices;

means for stroing the periodic component waveforms of the selected voices;

means for generating addresses for selectively causing the reading from the quasi-periodic component storage means, in accordance with the selective actuation of keys and switches for choosing notes and voices, the quasi-periodic component waveform of at least one selected voice;

means for generating addresses for selectively causing the reading from the periodic component waveform storage means, in accordance with the selective actuation of keys and switches for choosing notes and voices, the periodic component waveform of one or more selected voices;



means for combining and converting the waveform outputs of the storage means of the quasi-periodic component of at least one selected voice and the waveform outputs of the storage means of the periodic component of one or more selected voices to replicate the compound voice waveform of the one or more selected voices.

4,984,497

TONE SIGNAL GENERATION DEVICE HAVING A TONE ELEMENT CONTROL FUNCTION

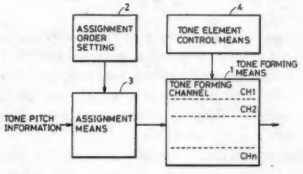
Yoshihiro Inagaki; Hideo Yamamoto, and Tetsuo Mishimoto, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Nov. 30, 1987, Ser. No. 126,840

Claims priority, application Japan, Nov. 28, 1986, 61-283274; Nov. 28, 1986, 61-283275

Int. Cl.[5] G10H *7/00, 1/02*

U.S. Cl. 84—626 **7 Claims**



1. A tone signal generation device comprising:

tone forming channels each forming a tone signal representing a tone to be sounded of a tone pitch corresponding to assigned tone pitch information;

assignment order setting means for setting an order of assignment with respect to plural channels among sad tone forming channels;

assignment means for changing and designating, at each timing for generating a tone, a tone forming channel to which the tone pitch information of the tone to be sounded is to be assigned in order set by said assignment order setting means and assigning the tone pitch information to the designated channel; and

tone element control means for supplying to said tone forming channels a tone element control signal controlling a tone element of the tone signal formed in said tone forming channels, supplying tone element control signals which are different from one another with respect at least

to channels for which the order assignment is set by said assignment order setting means.

4,984,498

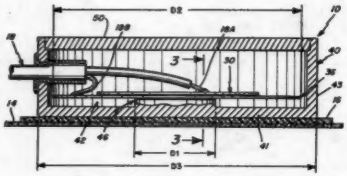
PERCUSSION TRANSDUCER

Lawrence Fishman, 76 Grove St., W. Medford, Mass. 02155

Continuation-in-part of Ser. No. 112,289, Oct. 26, 1987, abandoned. This application Sep. 6, 1989, Ser. No. 403,378

Int. Cl.[5] G10H *3/14, 3/12*

U.S. Cl. 84—730 26 Claims



1. In combination, a percussion transducer for a musical percussion instrument, said transducer for mounting on the said instrument and for converting a striking impact into a representative electrical impulse triggering signal, said transducer comprising:

a piezoelectric disc having oppositely disposed electrodes on either side thereof including top and bottom electrodes,

an electrically conductive disc,

means fixedly supporting said bottom electrode of said piezoelectric disc to an upper surface of said conductive disc,

a housing having an interior chamber in which is disposed said piezoelectric disc and conductive disc,

said housing including a bottom wall having a support platform for supporting said conductive disc at a lower surface thereof,

said housing further having a peripheral side wall defining a diameter of the housing that is greater than the diameter of the conductive disc and greater than the height of the housing,

said support platform being of smaller dimension than said conductive disc so that the periphery of said conductive disc is cantilevered beyond said support platform to provide enhanced piezoelectric impulse action,

lead means coupling to at least said piezoelectric disc for deriving a signal therefrom,

adhesive means for resiliently securing the conductive disc at its lower surface to the top surface of said support platform,

and means for securing the transducer to the instrument.

4,984,499

ELECTRONIC HARMONICA FOR CONTROLLING SOUND SYNTHESIZERS

Ron Schille, 701 Mills Ave., Apt. 3, San Bruno, Calif. 94066

Filed Mar. 6, 1989, Ser. No. 319,577

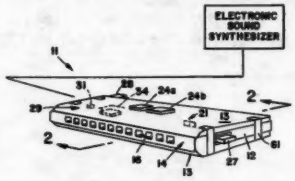
Int. Cl.[5] G10H *5/00*

U.S. Cl. 84—734 15 Claims

14. An electronic harmonica for controlling a sound synthesizing device that responds to control signals identifying musical notes which are to by synthesized, comprising:

a harmonica body having a plurality of spaced apart air passages,

a plurality of electrical strain gages in said body, each being positioned to be flexed by air flow in a separate one of said air passages and each having an electrical resistivity which changes in response to said flexing, and



means for producing said control signals by detecting changes of said resistivity of each of said strain gages that are produced by air flow variations in said air passages.

4,984,500

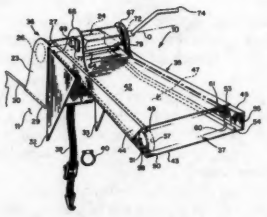
AMMUNITION CASING EXTRACTOR

Mark A. Cook, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washinhgton, D.C.

Filed Apr. 6, 1990, Ser. No. 506,415

Int. Cl.[5] C06B *21/00;* F42B *39/10*

U.S. Cl. 86—1.1 2 Claims



1. A device for extracting ammunition casings from linked tubes of a flexible ammunition carrier, comprising:

(a) a generally tubular chute having an entrance end and an exit end, said chute comprising an upper wall, a lower wall and first and second side walls, said side walls being divergent from each other along the length of said chute substantially from said entrance end to said exit end thereby defining a passageway therethrough extending from said entrance end to said exit end which substantially uniformly increases in width from near said entrance end to said exit end, said entrance end of said chute sized to receive said flexible ammunition carrier and said casings contained therein;

(b) first and second channels along respective said first and second side walls of said chute, said channels configured to diverge one from the other in correspondence with the divergence of said first and second side walls, said channels sized to receive respective annular flanges on said casings and said tubes of said flexible ammunition carrier; and

(c) means for forcing said flexible ammunition carrier through said chute from said entrance end to said exit end whereby respective said annular flanges of said casings and said tubes of said flexible ammunition carrier are separated along the length of said chute in correspondence with the divergence of said first and second channels, and said casings are thereby separated from said tubes of said flexible ammunition carrier near said exit end of said chute.

4,984,501

APPARATUS FOR PROCESSING CARTRIDGE CASES

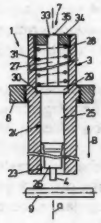
Johannes Roller, Siebensterngasse 43, A-1070 Vienna, Austria

Continuation of Ser. No. 385,675, Jul. 26, 1989, abandoned. This application May 22, 1990, Ser. No. 527,712

Claims priority, application Austria, Aug. 8, 1988, 1998/88

Int. Cl.[5] F42B *33/10, 33/02;* B21D *51/54;* B21K *21/04*

U.S. Cl. 86—36 **43 Claims**



21. In a loading or reloading or processing apparatus for center fire cartridges, a tool for processing cartridge cases with different fuzing systems, each cartridge case comprising a base at one end, defining an open mouth at an opposite end, and having an inside peripheral surface, an outside peripheral surface and a longitudinal center line, the fuzing system being held in the base and one of the fuzing systems including a central vent coaxial with the center line in the base, which comprises

(a) a housing,

(b) a movable sensing means for sensing the central vent in the cartridge case base,

(1) the sensing means being movably arranged in the housing for movement along the longitudinal center line,

(2) the sensing means being movable into the cartridge case through the cartridge case mouth and along the longitudinal center line by movement of the housing relative to the cartridge case until the sensing means senses an open central vent in the cartridge case base, and

(3) the sensing means being arranged during the relative movement in a predetermined initial position which enables the sensing means to be displaced relative to the housing in a direction opposite to the direction of movement into the cartridge case in the absence of an open vent in the cartridge case base,

(c) a repositioning means arranged to

(1) hold the sensing means in the predetermined position during the movement into the cartridge case,

(2) oppose the displacement of the sensing means from the predetermined position, and

(3) return the sensing means to the predetermined initial position after it has been displaced, and

(d) an indicator means arranged to indicate the displacement of the sensing means as indicating the fuzing system held in the cartridge case base.

4,984,502

APPARATUS AND METHOD FOR BRAIDING FIBER STRANDS AND STUFFER FIBER STRANDS

Raymond G. Spain, Farmington Hills, and Carlos Bailey, Farmington, both of Mich., assignors to Airfoil Textron Inc., Lima, Ohio

Filed May 9, 1988, Ser. No. 191,564

The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.

Int. Cl.[5] D04C *1/06, 3/00*

U.S. Cl. 87—8 **12 Claims**

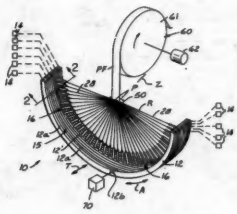
1. An apparatus for forming an article by intertwining a plurality of fiber strands and stuffer fiber strands, comprising:

(a) a plurality of movable support members arranged side-by-side to form a carrier surface,

(b) a plurality of carrier members movably disposed on the carrier surface for carrying a plurality of fiber strands for intertwining,

(c) means for moving the support members relative to one another,

(d) means for moving the carrier members from one support member to another,



(e) a plurality of means disposed on the support members and movable therewith for dispensing a respective stuffer fiber strand from each dispensing means as said support members move for intertwining with said fiber strands, and

(f) take-up means for moving the intertwined fiber strands and stuffer fiber strands away from the carrier surface.

4,984,503

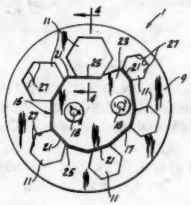
WRENCH

Dennis G. Farnsworth, Manchester, Mo., assignor to Newington Corporation, Manchester, Mo.

Filed Jul. 10, 1989, Ser. No. 377,552

Int. Cl.[5] B25B *9/00*

U.S. Cl. 81—13 **11 Claims**



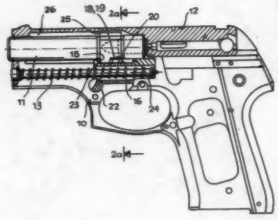
1. A wrench for holding one fastener element of a nut-and-bolt fastener against rotation while the other fastener element is turned to tighten or loosen the fastener, said wrench comprising a wrench plate having a plurality of different size polygonal openings therein for fitting fastener elements of different sizes, said wrench plate being adapted to engage a part adjacent thereto when said other fastener element is turned for holding said one fastener element against rotation, and holding means comprising a sheet of resilient material affixed to one face of the wrench plate generally at the center thereof, the sheet of resilient material projecting a relatively small distance beyond an edge of each opening for resilient engagement by said one fastener element when the latter is fitted in said opening, said resilient engagement holding the wrench plate in a fixed, self-retaining position with respect to said one fastener element prior to turning said other fastener element whereby both hands may be used to turn the latter for tightening or loosening the fastener.

4,984,504

DEVICE TO OPEN AND CLOSE THE BOLT IN SEMIAUTOMATIC PISTOLS

Pier G. Beretta, Gardone V.T., Italy, assignor to Fabbrica D'Armi P. Beretta S.p.A., Gardone V.T., Italy

Filed Sep. 6, 1989, Ser. No. 403,568
Int. Cl.[5] F41A *5/06*
U.S. Cl. 89—163 4 Claims



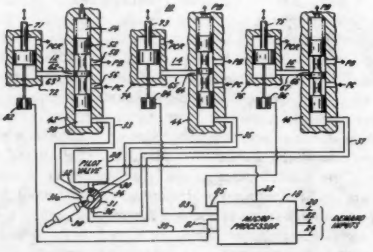
1. A semiautomatic pistol construction, comprising: a stock including a fixed block with an outwardly extending tooth and outwardly extending abutments; a bolt positioned on said stock for axial movement along said stock between a forward position and a rearward position, a spring associated with said fixed block biasing said bolt into said forward position, said bolt having a barrel receiving opening and a stop plane surface extending into said opening, said stop plane surface having a bolt groove extending axially; a barrel positioned in said barrel opening of said bolt, said barrel being axially displaceable between said abutments, said barrel having a side defining a groove with an initial rectilinear groove portion extending substantially parallel to a central axis of said barrel followed by a helical groove portion, said barrel having another side defining a projecting shoulder, said tooth being engaged with said bolt, whereby said barrel rotates relative to said tooth as said tooth engages said helicoidal groove portion upon axial movement of said barrel, upon rotation of said barrel said shoulder coming into register with said bolt groove, thereby allowing said bolt to move rearwardly to its open position.

4,984,505

MULTIPLEXED HYDRAULIC CONTROL SYSTEMS

Plato J. Leeson, Rockford, and John W. Wardle, Roscoe, both of Ill., assignors to Woodward Governor Company, Rockford, Ill.,

Filed Feb. 1, 1989, Ser. No. 306,842
Int. Cl.[5] F15B *13/16*
U.S. Cl. 91—361 34 Claims



1. A time multiplexed fluid power control system having a plurality of channels for individually controlling the positions of a plurality of actuators in the respective channels in accordance with a corresponding plurality of electrical control signals, the control system comprising the combination of:

pilot means responsive to the plurality of electrical control signals for producing a plurality of fluid power signals having magnitudes related to the magnitude of the electrical signals,

multiplexing means for distributing the fluid power signals to the associated channels,

integrating means in the channels responsive to the associated fluid power signal, each integrating means producing an output fluid flow rate determined by the time integral of fluid flow from the multiplexing means for its associated channel,

the actuator in each channel being connected to receive the output fluid flow of the integrating means in that channel to control the position of each actuator in dependence upon the associated electrical signal for each channel, and

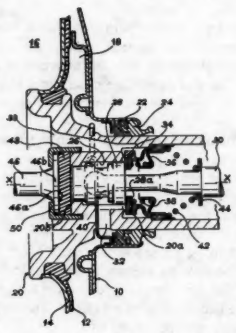
feedback means for producing signals relating to the rate of movement of the actuators and modifying the electrical control signals in accordance therewith.

4,984,506

BRAKE BOOSTER WITH ADJUSTABLE JUMP

Miguel Perez, Argenteuil, France, assignor to Bendix France, Drancy, France

Filed Apr. 24, 1989, Ser. No. 342,770
Claims priority, application France, Apr. 28, 1988, 88 05654
Int. Cl.[5] F15B *13/16*
U.S. Cl. 91—369.2 3 Claims



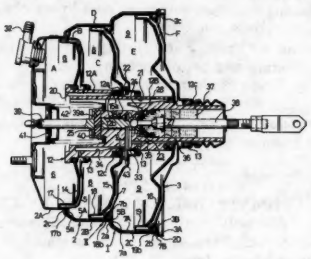
1. A brake booster comprising an outer casing having an axis, in which is mounted movably on said axis a hollow booster piston, a control rod carrying a plunger accommodated in the piston, a push rod, booster means accommodated in said casing and being controlled as a result of a forward movement of the plunger and having the effect of moving the piston forwards, a reaction disc made of a deformable material being interposed between an annular front face of the piston and a rear face of the push rod, in such a way that a play is normally formed, at rest, between a front face of the plunger and said reaction disc, and means for applying an adjustable prestress to the reaction disk between the annular front face of the piston and the rear face of the push rod so as to adjust said play, wherein said means comprises a cover screwed onto the piston around the annular front face of the piston, said cover capping a plate and the reaction disc, the plate formed on the push rod and comprising the rear face of said push rod.

4,984,507

THREE CHAMBER BRAKE BOOSTER WITH VARIABLE PRESSURE PASSAGES HAVING A MINIMUM CHANNEL LENGTH

Haruo Suzuki, and Tohru Satoh, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1989, Ser. No. 380,986
Claims priority, application Japan, Jul. 26, 1988, 63-186634; Oct. 24, 1988, 63-267575
Int. Cl.[5] F15B 9/10
U.S. Cl. 91—376 R 7 Claims



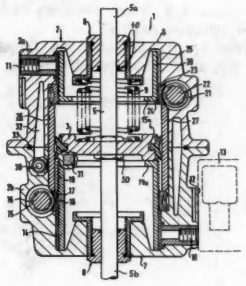
1. A brake booster comprising a shell; a front plate and a rear plate fixedly mounted inside the shell for dividing the interior of the shell into a front chamber, a center chamber and a rear chamber; a valve body slidably extending through the front plate and the rear plate; a front power piston, a center power piston and a rear power piston disposed within the front chamber, the center chamber and the rear chamber, respectively, and connected to the valve body; a front diaphragm, a center diaphragm and a rear diaphragm applied to the back side of the front power piston, the center power piston and the rear power piston, respectively, for dividing the interior of each of the front chamber, the center chamber and the rear chamber into a forwardly located, constant pressure chamber and a rearwardly located, variable pressure chamber; a constant pressure passage disposed to provide a communication between the constant pressure chambers formed in the front chamber, the center chamber and the rear chamber; a variable pressure passage disposed to provide a communication between these variable pressure chambers formed in the front chamber, the center chamber and the rear chamber; a valve mechanism received within the valve body for switching a communication between the constant pressure chambers, the variable pressure passage and a pressure passage which supplies pressure fluid; and an input shaft operatively associated with a brake pedal to be driven in a reciprocatory manner to cause the valve mechanism to switch a flow path therein in response thereto; wherein the variable pressure passage comprises a first variable pressure passage which provides a communication between the variable pressure chamber of the center chamber and the valve mechanism, a second variable pressure passage which provides a communication between the variable pressure chamber of the front chamber and the valve mechanism, and a third variable pressure passage which provides a communication between the variable pressure chamber of the rear chamber and the valve mechanism, the first variable pressure passage having a channel length which is less than that of the remaining variable pressure passages.

4,984,508

PISTON DRIVE

Fritz Müller, Neuer Wasen 6, 7118 Ingelfingen-Criesbach, Fed. Rep. of Germany

Filed Mar. 24, 1989, Ser. No. 328,480
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811110
Int. Cl.[5] F15B 15/24
U.S. Cl. 92—13.5 18 Claims



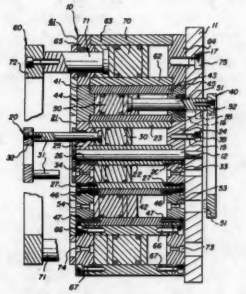
1. A piston drive, comprising:
a housing;
piston means including a piston reciprocating in said housing between two end positions;
insert means including a first insert arranged in said housing and projecting into the path of movement of said piston for defining one of said end positions of said piston; and
driving means for axially displacing said first insert to allow adjustment of said one end position of said piston, said driving means including a first worm drive arranged in said housing and acting upon said insert.

4,984,509

MULTISTAGE CYLINDER ACTUATOR

Hideo Hoshi, 19-14, Maru-no-uchi 3-chome, Naka-Ku, Nagoya-shi, Aichi-ken, Japan

Filed Jun. 1, 1989, Ser. No. 360,181
Claims priority, application Japan, Jun. 20, 1988, 63-152012
Int. Cl.[5] F01B 13/00
U.S. Cl. 92—107 10 Claims



1. A multistage cylinder actuator comprising a center cylinder unit and at least one annular auxiliary cylinder unit which is concentrically located around the center cylinder unit, each of said cylinder units including a cylinder housing removably attached to a common plate and a piston slidably mounted for reciprocating movement internally of the cylinder housing,

said piston slidably mounted internally of said auxiliary cylinder unit is a annular piston, a plurality of piston rods concentrically located relative to said center cylinder unit connect said annular piston to a pressure plate, and means for independently operating each of said pistons.

4,984,510

SYSTEM FOR POSTING ARTICLES INTO A CONTAINMENT

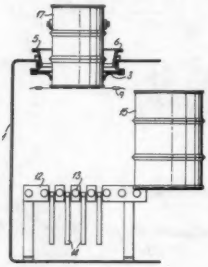
Richard J. Critchley, Chorley, and Samuel R. Oldham, Tameside, both of United Kingdom, assignors to British Nuclear Fuels Plc, Warrington, England

Filed Apr. 11, 1988, Ser. No. 180,081

Claims priority, application United Kingdom, May 1, 1987, 8710388

Int. Cl.[5] G21K *5/00*

U.S. Cl. 98—1 **4 Claims**



1. A system for posting articles into a containment maintained at sub-atmospheric pressure comprising a posting port in a wall of the containment having a sphincter seal and a removable lid, the sphincter seal being such as to engage articles posted through the port and to permit an inward air flow into the containment to oppose back-diffusion from the containment.

4,984,511

BEVERAGE BREWING APPARATUS FOR VENDING MACHINES

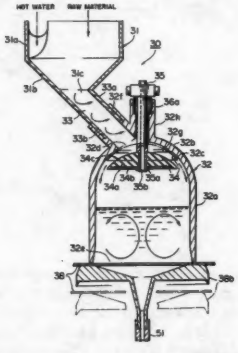
Ryoichi Sekiguchi, Isesaki, Japan, assignor to Sanden Corporation, Japan

Filed Nov. 27, 1989, Ser. No. 441,480

Claims priority, application Japan, Nov. 25, 1988, 63-152394[U]; Nov. 25, 1988, 63-152396[U]; Nov. 25, 1988, 63-152397[U]; Nov. 25, 1988, 63-152398[U]

Int. Cl.[5] A47J *31/32*

U.S. Cl. 99—287 **22 Claims**



1. A beverage brewing apparatus, comprising:

mixing chamber means for mixing a liquid and a beverage material to make a beverage liquid, said mixing chamber means having an outflow port through which the beverage liquid is discharged, said mixing chamber means having a chamber side;

a lower chamber positioned generally below said mixing chamber means, said lower chamber having an inlet port through which beverage liquid passes from said mixing chamber means into said lower chamber, said lower chamber having a bottom opening;

a straight cylindrical pipe communicating said outflow port and said inlet port, extending along a straight line therebetween, and through which the beverage liquid passes from said mixing chamber means to said lower chamber, said pipe having an upper straight line extension thereof defining said chamber side and a lower straight line extension intersecting an upper surface of said lower chamber and defining a corner therewith;

valve means for opening and closing said inlet port;

a filter covering said bottom opening; and

supplying means for supplying pressurized gas into said lower chamber, when said inlet port is closed by said valve means, and forcibly filtering beverage liquid in said lower chamber through said filter.

4,984,512

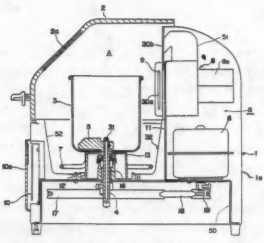
AUTOMATIC BREAD-MAKING DEVICE

Yoshinori Takahashi, Nari; Jun Misaki, Shijonawate, and Takayuki Karaki, Nara, all of Japan, assignors to Zojirushi Corporation, Osaka, Japan

Filed Oct. 11, 1989, Ser. No. 419,794

Int. Cl.[5] A47J *27/00*

U.S. Cl. 99—327 **1 Claim**



1. An automatic bread-making device comprising a housing having a cooking chamber, a cooking vessel removably arranged in said cooking chamber for containing all the ingredients of bread, kneading means arranged in said cooking vessel for kneading said ingredients of bread into a dough, heating means arranged in said cooking chamber to bake the dough in said cooking vessel, means for cooling the bread, and a control system for controlling said kneading means and said heating means to automatically carry out, in sequence, a series of steps in the bread-making process including a first kneading step in which all the ingredients are kneaded into a dough, a first leavening step for leavening the dough, a second kneading step for degassing the dough, a second leavening step for leavening the dough, a third kneading step for degassing the dough, a third leavening step for shaping the dough, a baking step for baking the dough, and a cooling step for cooling the produced bread, said control system comprising:

program memory means for storing a basic program for carrying out, in sequence, all the steps of said bread-making process;

manually operated switch means for selecting a manual operation mode and for forwarding the operating step of said bread-making process from one of said steps to the subsequent step;

a timer adapted to be started to count a time every time said switch means is operated so as to determine the period of time required for performance of each step of said bread-making process;

data storage means for storing data on the period of time determined by said timer to modify said basic program for future operation; and

controlling means responsive to the program stored in said program memory means or in said data storage means.

4,984,513

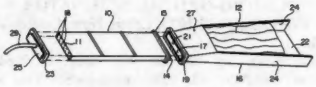
APPARATUS FOR COOKING AND SHAPING MEAT PIECES

Paul Choquette, Longueuil, Canada, assignor to Corporation Salaison Melrose, Montreal, Canada

Filed Oct. 21, 1988, Ser. No. 261,039

Int. Cl.[5] A47J *27/20*; B30B *7/00*

U.S. Cl. 99—349 **8 Claims**



1. An apparatus for cooking and shaping a precut, uncooked piece of meat, comprising in combination:

a shaping mold having a meat inlet and being structured to receive therein the precut uncooked piece of meat, said shaping mold constituting a cooking vessel;

vacuum establishing means including opening means made in the shaping mold and generally facing the said meat inlet, for producing a sub-atmospheric pressure in the shaping mold to thereby drive in the said mold the uncooked piece of meat placed adjacent said meat inlet; and

means for heating said shaping mold for thereby cooking said piece of meat.

4,984,514

EXTRUDER APPARATUS FOR PRODUCING AN AT LEAST PARTIALLY BAKED PRODUCT HAVING A COOKIE-LIKE CRUMB STRUCTURE INCLUDING A POST EXTRUSION MICROWAVE DEVICE

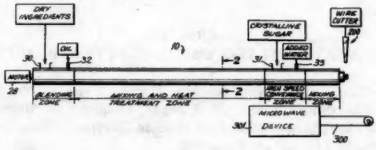
Bernhard H. van Lengerich, Ringwood, N.J., assignor to Nabisco Brands, Inc., East Hanover, N.J.

Filed Jun. 7, 1989, Ser. No. 362,376

The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.

Int. Cl.[5] A21C *3/04*; A47J *27/12*; A23P *1/00*

U.S. Cl. 99—353 **17 Claims**



1. An extruder, which comprises

a housing including a screw channel formed along the longitudinal axis of the housing;

at least one screw-type element rotatably received within the screw channel to convey and mix ingredients;

a feed port means arranged in the housing adjacent the upstream end thereof to input ingredients into the screw channel for conveyance and mixing by the screw-type element;

means for inputting at least certain ingredients of a cookie-like dough formulation, including oil and flour, with less than a preselected total water content, by weight, of the ingredients;

the means for inputting being coupled to the feed port means;

an added water inlet port arranged in the housing downstream from the feed port means to input water into the screw channel;

a vigorous mixing zone formed by the screw channel and screw-type element intermediate the feed port means and the added water inlet port to vigorously mix and convey the ingredients input into the feed port means;

a temperature control means operating to elevate the temperature of the screw channel for heat treatment of the ingredients input into the feed port means in a heat treatment zone of the housing extending intermediate the feed port means the added water inlet port;

a source of water coupled to the added water inlet port to add a preselected amount of water through the added water inlet port to increase the water content and modify the consistency of the ingredients input into the feed ports means at a location in the screw channel downstream from the vigorous mixing and heat treatment zones;

a mixing zone formed by the screw channel and screw-type element downstream from the added water inlet port and operating to mix the added water throughout the heat treated ingredients under pressure and temperature conditions to avoid substantial oil separation from the heat treated ingredients and added water; and

an output means at the downstream most end of the housing; and

a microwave device coupled to the output means of the extruder to receive and further heat treat the ingredients output by the output means.

4,984,515

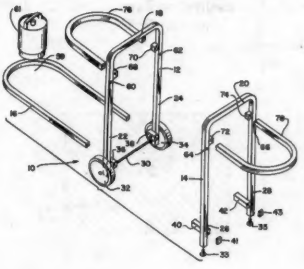
PORTABLE BARBEQUE GRILL CART

Ralph M. Pivonka, 915 Maple, La Crosse, Kans. 67548

Filed Jan. 3, 1989, Ser. No. 292,881

Int. Cl.[5] A47J *36/34*

U.S. Cl. 99—449 **19 Claims**



1. A cart comprising:

a unitary base portion and a pair of oppositely disposed end portions;

connecting means for connecting said unitary base portion to said end portions, wherein said connecting means comprises a plurality of slip sleeves fixedly attached to each of said end portions and wherein said plurality of slip sleeves are constructed and arranged for telescopic interconnection of said unitary base portion to said end portions; and

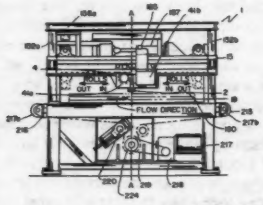
at least one nut fixedly attached to each of said slip sleeves, said nuts having bolt members extending through said slip sleeves for tightening against said unitary base portion thereby securing said unitary base portion to said end portions.

4,984,516

APPARATUS FOR REMOVING FLUID FROM OVERLAPPING SHEETS OF MATERIAL

Attilio Scalzitti, 1258 Exeter Ct., Wheaton, Ill. 60187, and Clarence A. Sayder, 3024 Whitepine Dr., Northbrook, Ill. 60062

Filed Oct. 7, 1988, Ser. No. 254,973
Int. Cl.[5] B30B *9/00, 3/02*
U.S. Cl. 100—90 **13 Claims**



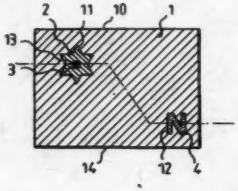
1. An apparatus for removing fluid from overlapping sheets of material, said apparatus comprising an inverted T-bar means for applying stationary pressure to overlapping sheets disposed beneath said T-bar means, and at least two roller assembly means, said roller assembly means each including a lower pressure roller and an upper drive roller, said drive roller being in frictional contact with both said pressure roller and a superstrate positioned above said drive roller, at least one roller assembly means being positioned on each side of said T-bar means such that said pressure roller and said drive roller are substantially parallel thereto, and said roller assembly means being adapted to apply a moving pressure through said pressure rollers to overlapping sheets disposed beneath said roller assembly means.

4,984,517

METHOD OF MULTICOLOR PRINTING A MATERIAL

Luc Doublet, 80 rue Burgault, Seclin, France

Filed Sep. 29, 1986, Ser. No. 912,926
Claims priority, application France, Dec. 27, 1985, 85 19523
Int. Cl.[5] B41M *3/00*
U.S. Cl. 101—470 **21 Claims**



1. A method of printing a material, notably in the manufacture of flexible articles such as flags or upholstery hangings, wherein a material is decorated with a multicolor design consisting of an assembly of primary elementary forms, for example geometric forms, letters or numerals having each primary color, said multicolor design being formed preliminarily on a provisional carrier from inks adapted to be transferred to said material by the combined action of heat and pressure, said method comprising the steps of:

forming a bundle of colored sheets by stacking a plurality of sheets flat tinted on one side with sublimable ink, said bundle comprising at least one sheet of each primary color necessary for obtaining the final multicolor design,

forming simultaneously by cutting each sheet of said bundle the contours of the elementary forms of said decorative design with respect to the outer periphery or contour of the material to be decorated, each sheet being thus provided identically with precut areas corresponding to the elementary forms of the final design,

composing on a provisional carrier the multicolor decorative design by superposing and/or juxtaposing precut primary elementary forms taken from the corresponding primary color sheet, and

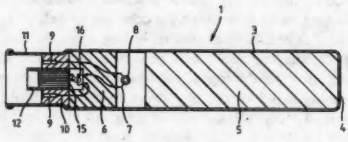
transferrring the thus composed multicolor design from said provisional carrier to the material to be decorated while maintaining a close contact by pressure between said provisional carrier and said material, and heating the material for sublimating the inks and diffusing the inks in the material under accurate position control conditions.

4,984,518

ELECTRO-OPTICAL DETONATOR

Arthur G. Yarrington, MS 1073, Crows Nest, Queensland 4355, Australia

Continuation-in-part of Ser. No. 283,278, filed as PCT AU88/00067 on Mar. 11, 1988, abandoned. This application Jan. 3, 1990, Ser. No. 460,567
Claims priority, application Australia, Mar. 17, 1987, PI0881
Int. Cl.[5] F42C *19/00*
U.S. Cl. 102—201 **7 Claims**



1. A detonator comprising:

a hollow body portion having a closure at a distal end and an opening at a proximal end; a quantity of explosive detonating material located within said body portion adjacent said distal end;

an electrical resistance element spaced from said quantity of detonating material, said electrical resistance element having associated therewith a quantity of thermally energizable initiating pyrotechnic material: and,

switching means responsive to electromagnetic radiation, said switching means being coupled with said electrical resistance element to selectively close an electrical circuit associated with said resistance element in response to energization by a source of electromagnetic radiation.

4,984,519

DELAY CIRCUIT FOR USE IN ELECTRIC BLASTING SYSTEM

Koji Ochi, Iwamizawa; Masahide Harada, Sapporo, and Kunio Kobayashi, Takasaki, all of Japan, assignors to Nippon Oil and Fats Company, Limited; Harada Electronics Industry and Hitachi Ltd., all of, Japan

Filed Feb. 13, 1989, Ser. No. 309,157
Claims priority, application Japan, Feb. 16, 1988, 63-31869
Int. Cl.[5] F23Q *21/00*
U.S. Cl. 102—217 **5 Claims**

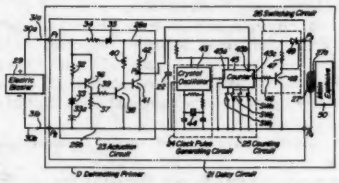
1. A delay circuit for use in an electric blasting system comprising:

a capacitor for storing an electric energy supply from a power supply source;

an actuation circuit including a voltage threshold element which is cut-off when a terminal voltage applied to the actuation circuit becomes lower than a threshold voltage of greater than one volt and generating an actuation signal when the terminal voltage decreases to the threshold voltage;

a clock pulse generating circuit energized with the energy stored in the capacitor and generating clock pulses when so energized;

a counting circuit for initiating to count the clock pulses in



response to said actuation signal and producing an igniting signal when a predetermined number of said clock pulses are counted; and

a switching circuit for discharging the electric charge stored in the capacitor in response to said igniting signal.

4,984,520

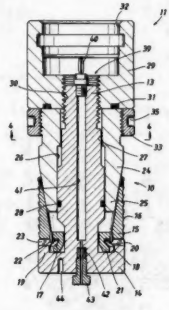
ENCLOSED PERFORATING GUN WITH EXPENDABLE CARRIER

Cliff L. Aseltine, Houston, and Gary M. Lendermon, Missouri City, both of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Continuation of Ser. No. 229,520, Aug. 5, 1988, abandoned. This application Apr. 26, 1989, Ser. No. 344,489

Int. Cl.[5] F42B *3/00*

U.S. Cl. 102—313 **27 Claims**



1. Perforating apparatus comprising:

a pipe having rough and irregular internal wall surfaces; and

a set of end closure members in each end of said pipe and expanded radially outwardly against said internal wall surfaces, each of said closure members including a mandrel with an enlarged portion and a threaded portion, a set of anchor elements movably arranged around said mandrel and having bases slidably disposed on said enlarged mandrel portion and upstanding end portions with serrated outer edges and inner edges defining a frustoconical recess around said mandrel, a first body slidably arranged on said mandrel having a frustoconical nose complementally fitted in said recess, a second body threadedly coupled to said threaded mandrel portion for advancing said nose toward said enlarged mandrel portion and into said recess for shifting said anchor elements outwardly to anchor said serrated edges with said internal wall surfaces, and means providing a fluid-tight seal between said nose and said internal wall surfaces including a rigid backup ring arranged around said nose and engaged with said upstanding end portions for bridging gaps left therebetween, a deformable backup ring arranged around said nose and said rigid ring for filling circumferential spaces between said rigid ring and said internal wall surfaces, and an annular sealing member arranged around said nose and said deformable ring for being sealingly engaged between said nose and said internal wall surfaces when said anchor elements are engaged therewith.

4,984,521

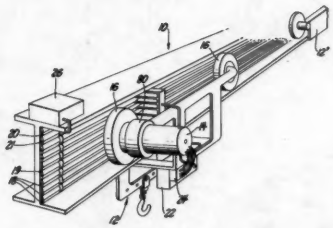
CONVEYOR CONTROL

Ron Riley, Grand Blanc, Mich., assignor to J. N. Fauver Company, Inc., Madison Heights, Mich.

Filed Mar. 23, 1987, Ser. No. 28,793

Int. Cl.[5] B60L *13/00, 15/00*

U.S. Cl. 104—290 **76 Claims**



1. A conveyor control assembly including a trolley vehicle (12) which moves along rails (20), wherein said vehicle (12) is powered from rail voltages (18), said assembly comprising: a vehicle (12) including wheels (16) for mobility, a variable speed motor (14) within said vehicle (12) for rotating said wheels (16); a plurality of rails for supporting said vehicle (12); said plurality of rails including power rails (18) for supplying power to said motor (14); said assembly characterized by said plurality of rails (20) including at least one command rail for producing an analog command signal along said command rail (20) indicative of requested speed which represents one of a plurality of speeds, the command signal having a first magnitude range indicative of requested speed in a forward direction wherein requested speed is represented by the magnitude of said analog command signal within said first magnitude range and a second magnitude range indicative of requested speed in a reverse direction wherein the requested speed is represented by the magnitude of said analog command signal within said second magnitude range, and control means (22) within said vehicle (12) for receiving said analog command signal and interpreting it to drive said motor (14) to move said vehicle (12) at said requested speed in one of said forward direction and reverse direction.

4,984,522

RAILROAD CAR DIAPHRAGM ASSEMBLY

James M. Parish, Wadsworth, Ohio, assignor to SMR Technologies, Inc., Uniontown, Ohio

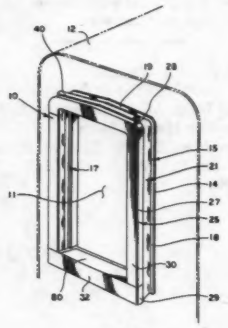
Filed Sep. 20, 1989, Ser. No. 409,776

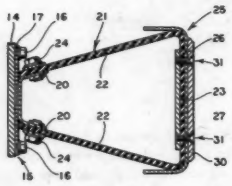
Int. Cl.[5] B61D *17/20, 17/22*

U.S. Cl. 105—15 **48 Claims**

1. Apparatus for enclosing the longitudinal space between the doors of adjacent vehicular cars, each of the cars being provided with a diaphragm assembly, each diaphragm assembly comprising mounting plate means mounted on the car along the sides of the door and over the door in an arch-like fashion, said mounting plate means being of a predetermined width, flexible membrane means having two side portions and a bridging portion extending generally laterally therebetween, face plate means having a predetermined width greater than the predetermined width of said mounting plate means, and

means to attach said side portions of said flexible membrane means to said mounting plate means and to attach said bridging portion of said flexible membrane means to said face plate means so that said flexible membrane means takes on the con-





figuration in section of a truncated cone so that as the cars negotiate a turn and said flexible membrane means distorts, said mounting plate means does not engage or bind with said flexible membrane and said face plate means.

4,984,523

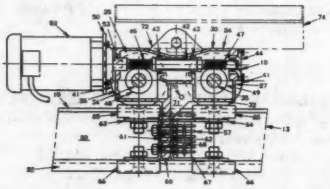
SELF-PROPELLED TROLLEY AND SUPPORTING TRACK STRUCTURE

Clarence A. Dehne, Farmington Hills, and Daniel S. Ellens, Brighton, both of Mich., assignors to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Dec. 7, 1988, Ser. No. 281,192

Int. Cl.[5] B61B *3/00*; E01B *25/22*

U.S. Cl. 105—155 **16 Claims**



1. A self-propelled industrial material handling system trolley adapted to travel on track structure having a longitudinal centerline and a pair of trolley supporting track surfaces transversely spaced to either side of said longitudinal centerline, wherein said trolley comprises:

a trolley body forming a drive mechanism housing defined by longitudinally spaced end walls, transversely spaced side walls, and an upper wall extending between said side and end walls;

a pair of longitudinally spaced, transversely extending axles rotatably carried by said housing, each axle having a central portion disposed within said housing and opposite end portions projecting from said side walls;

a pair of wheels mounted on the end portions of each of said axles, each pair of wheels being adapted to engage said pair of supporting track surfaces;

a longitudinally extending drive shaft having opposite ends, said drive shaft being rotatably supported within said housing between said end walls, said pair of axles being located intermediate said drive shaft ends, and driving means for operably connecting said drive shaft to each of said axles;

a motor adapter flange mounted on one of said housing end walls;

a drive motor attached to said adapter flange and drivingly coupled to one end of said drive shaft; and

load attachment means provided on said housing upper wall for supporting a load above said trolley body, the weight of such load being distributable substantially equally among said wheels.

4,984,524

TECHNIQUE FOR CONTROLLING THE COMBUSTION OF FUEL HAVING FLUCTUATING THERMAL VALUES

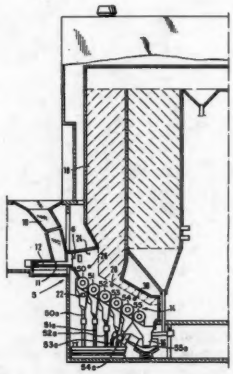
Kurt-Henry Mindermann, Eggerscheidter Str. 112, D-4030 Ratingen, and Franz Wintrich, Berkenberg 25a, D-4300 Essen 13, both of Fed. Rep. of Germany

Continuation of Ser. No. 261,514, Oct. 24, 1988, Pat. No. 4,895,082. This application Oct. 2, 1989, Ser. No. 416,270

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1987, 3736067

Int. Cl.[5] F23H *5/18*

U.S. Cl. 110—346 **18 Claims**



1. A method for controlling combustion of fuel having widely fluctuating thermal values, comprising the steps of:

feeding said fuel to a grid in a combustion chamber via an inlet thereof;

conveying said fuel along said grid through a degassing and evaporating zone, a primary combustion zone, and a secondary combustion zone in said combustion chamber to an ash removal station;

supplying primary combustion air to said grid from therebeneath;

obtaining, in an area delimited by said inlet and said degassing and evaporation zone, a measurement signal related to at least one of the (i) water content of the fuel, and (ii) carbon dioxide content of the combustion gases; and

controlling variation of heat flow in said combustion cham-

ber so as to derive a constant thermal output based on the relationship

$$\frac{dQ}{dt} = \frac{dM_m}{dt} \times H_u + \frac{dH_u}{dt} \times M_m,$$

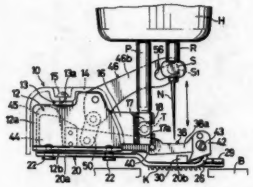
where Q is heatflow, M_m is mass of fuel, and H_u is thermal value of the fuel, by adjusting at least one parameter affecting combustion of said fuel in the combustion chamber based on using said measurement signal as the dH_u/dt term in said relationship.

4,984,525

WORK CUTTING ATTACHMENT FOR ZIGZAG SEWING MACHINES

Mikio Mori, 12-2, Chidori-cho 3-chome, Ogaki-shi, Gifu-ken, Japan

Filed Aug. 23, 1989, Ser. No. 397,316
Claims priority, application Japan, Aug. 31, 1988, 63-219482
Int. Cl.[5] D05B *37/06*
U.S. Cl. 112—128 **6 Claims**



1. A work cutting attachment for use with a zigzag sewing machine having a presser bar, an endwise reciprocating needle bar with means mounting said needle bar for vertical movement, and a feed dog, comprising:

a base plate, means for removably securing said base plate to said presser bar;

a presser foot mounted on said base plate for holding a work fabric against said feed dog and having a needle clearance aperture;

a fixed blade secured to said presser foot;

a cutting blade;

a support mechanism supporting said cutting blade for vertical movement relative to said fixed blade; and

a driving mechanism including means for operatively connecting said needle bar and said support mechanism for transmitting the vertical movement of said needle bar through said support mechanism to said cutting blade so as to move the latter vertically relative to said fixed blade.

4,984,526

THREAD CHAIN GUIDING DEVICE FOR OVEREDGE SEWING MACHINES

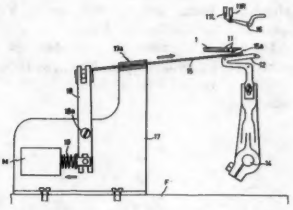
Hiroshi Ide; Kikuo Aida, and Shingo Iwae, all of Chofu, Japan, assignors to Juki Corporation, Tokyo, Japan

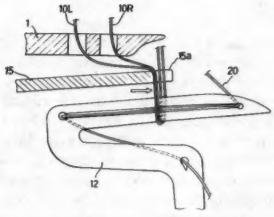
Continuation of Ser. No. 101,257, Sep. 25, 1987, abandoned. This application May 23, 1989, Ser. No. 356,574
Claims priority, application Japan, Sep. 30, 1986, 61-233596
Int. Cl.[5] D05B *1/20, 65/00*
U.S. Cl. 112—162 **3 Claims**

2. In an overedge sewing machine having a needle plate with inner and outer chain off fingers, a thread chain guiding device comprising:

(a) a lower looper reciprocally movable about its lower end for catching needle threads to form an overedge stitch, said lower looper located under said needle plate;

(b) a needle-thread guide located under the needle plate to move between a first position where said needle-thread guide is engaged with said needle threads and a second position where said needle-thread guide is disengaged from said needle threads, said needle-thread guide adapted to transfer the needle threads to a position near to said outer chain off finger and remote from said inner chain off finger where said lower looper catches said needle threads; and





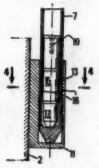
(c) means for extending said needle-thread guide into engagement with said needle threads when the sewing machine is stopped and retracting said needle-thread guide away from said needle threads when the sewing machine is operating.

4,984,527

DEVICE FOR THE REMOTE ASSEMBLY OF TWO MEMBERS

Jean Falcimaigne, Bois Colombes, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Continuation of Ser. No. 863,720, May 16, 1986, abandoned. This application Aug. 25, 1988, Ser. No. 236,447
Claims priority, application France, May 17, 1985, 85 07583
Int. Cl.[5] B63B *35/44*
U.S. Cl. 114—264 **11 Claims**



1. A device for remote assembly of two members by an oblong assembly element, the device comprising means for anchoring said assembly element on a first member of said two members, remote controlled means for tensioning said assembly element on said first member after an anchoring of the assembly element on said first member, and remote controlled means for locking said assembly element on a second member

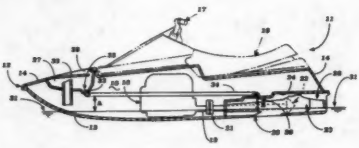
of said two members subsequent to a tensioning by said tensioning means whereby said first and second members are firmly urged against each other and fixedly held together by said assembly element.

4,984,528

VENTING AND DRAIN ARRANGEMENT FOR SMALL WATERCRAFT

Noboru Kobayashi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 27, 1989, Ser. No. 441,384
Claims priority, application Japan, Nov. 28, 1988, 63-301928
Int. Cl.[5] B63B *35/00*
U.S. Cl. 114—270 8 Claims



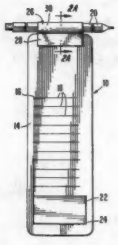
1. A hull construction for a small watercraft defining a tunnel on the underside of said hull for containing at least in part a propulsion unit, an engine compartment formed within said hull for accommodating an internal combustion engine for driving said propulsion unit, a venting recess formed in an upper portion of said hull, a vent pipe extending through said hull in said venting recess from an inlet end communicating with the atmosphere to an outlet end communicating with said engine compartment, a well formed by said venting recess in which water may accumulate, and drain means extending from said well to said tunnel for draining water from said well to the body of water in which said watercraft is operating.

4,984,529

EDUCATIONAL METHOD, REUSABLE EDUCATIONAL BOOKMARKING DEVICE AND WRITING INSTRUMENT CLIP

Sandra L. Dickson, P.O. Box 1176, Newnan, Ga. 30263

Filed Jun. 28, 1989, Ser. No. 372,603
Int. Cl.[5] B42D *9/00*
U.S. Cl. 116—234 6 Claims



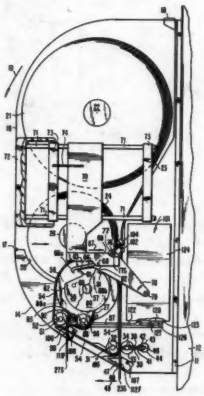
1. A reusable educational bookmarker device comprising:
a thin sheet assembly having a predetermined size which can serve as a removable replaceable locator for text material;
said sheet assembly being made of a smooth body of plastic material and including printed indicia on at least one surface thereof which facilitate recording and compilation of information from the text;
said recording surface being defined by smooth clear plastic surface such that recorded indicia can be recorded and erased therefrom, thereby allowing said bookmarker device to be reused;
said printed indicia facilitate recording and compilation of words and/or notes from the text to be read; and
clip means attached to said sheet assembly for resiliently and releasably retaining a writing instrument used for recording the information on said recording surface;
said clip means includes a rigid attaching portion having energy deflectors comprising a plurality of rail-like projections projecting from and extending along one surface of said rigid attaching portion, which facilitate ultrasonic welding of said attaching portion to said plastic material of said sheet assembly, and a writing instrument retaining portion which releasable retains the writing instrument.

4,984,530

HAND WASH TOWEL DISPENSING SYSTEM

Virgil R. Dutton, Chandler, Ariz., assignor to Core Medical Corporation, Scottsdale, Ariz.

Filed Oct. 27, 1988, Ser. No. 263,392
Int. Cl.[5] B05C *11/00*
U.S. Cl. 118—43 29 Claims



1. A towel dispenser comprising:
a housing;
first storage means in said housing to store toweling to be dispensed;
release means operable, when actuated, to release toweling from said storage means;
wetting means associated with said storage means for wetting a towel released from said storage means,
and means for dispensing wet and dry toweling substantially simultaneously from said housing;
said storage means including a first roll of dry toweling to be dispensed wet, and a second roll of dry toweling to be dispensed dry; and
the toweling material in said first roll being less absorbent per square inch than the toweling material in said second roll.

5. A method of dispensing toweling and comprising the steps of:
responding to an initiating signal to present at designated stations, an exposed edge of toweling from a first supply and an exposed edge of toweling from a second supply; and
delivering predetermined lengths of toweling from said first supply and from said second supply in response to pulling one of said exposed edges of toweling.

4,984,531

DEVICE FOR ACCEPTING AND HOLDING A WORKPIECE IN VACUUM COATING APPARATUS

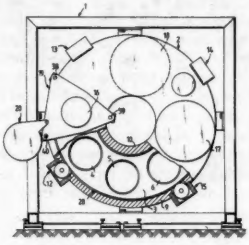
Jaroslav Zejda, Rodenbach, and Manfred Schuhmacher, Alzenau-Michelbach, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 11, 1989, Ser. No. 419,706

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1989, 3912296

Int. Cl.[5] B05C *3/09*

U.S. Cl. 118—50 20 Claims



1. In a vacuum coating apparatus having a workpiece carrier for conveying at least one workpiece between station positions within a process chamber, one station being a transfer station for the transfer of workpiece into and out from the process chamber, a device for retaining and holding the workpiece on the carrier comprising:

a crank-lever mechanism positioned at the transfer station; and

a clamping mechanism operatively mounted on the workpiece carrier, the crank-lever mechanism operatively interacting with the clamping mechanism to cause same to selectively grasp or release the workpiece.

4,984,532

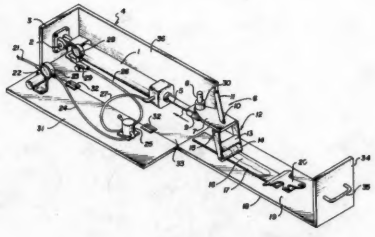
APPARATUS FOR CONTROLLING THE SPEED AND IMPRESSION ON A MANUAL INK PROOFER

Carey Winters, 401 Forty Oaks Farm Rd., West Monroe, La. 71297

Filed Aug. 23, 1989, Ser. No. 397,257

Int. Cl.[5] G01N *33/32*

U.S. Cl. 118—242 8 Claims



1. Apparatus for ink proofing comprising an ink proofer and means for controlling the speed and impression on said ink proofer, said ink proofer having a bifurcated arm, a roller rotatably mounted in said arm and adapted to engage a substrate, and a handle secured to said bifurcated arm, said controlling means comprising a motor, a carriage, means connected between said motor and said carriage for transferring reciprocatory movement to said carriage, the handle of said ink proofer being detachably connected to said carriage, means operatively connected to said carriage for adjusting the downward pressure on the carriage to thereby apply a predetermined impression on the ink proofer, and means operatively connected to the motor for varying the speed of retraction of the carriage.

4,984,533

APPLICATION DEVICE

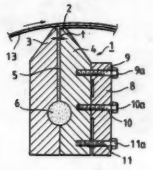
Shinsuke Takahashi; Norio Shibata, and Tsunehiko Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 11, 1989, Ser. No. 393,336

Claims priority, application Japan, Aug. 23, 1988, 63-207316

Int. Cl.[5] B05C *1/04;* B29C *47/16*

U.S. Cl. 118—419 7 Claims



1. An application device in which a liquid is discharged from a slit of an application head extending along the width of a continuously moving flexible carrier so that said liquid is applied to the surface of said carrier, the improvement comprising: a plurality of thick members provided on an outside of said head, said thick members having acting portions at ends thereof near a liquid discharge portion of said head, said members extending from said ends to the other ends thereof in directions perpendicular to said liquid discharge portion of said head, said members being provided with adjusting members at said other ends to apply forces to said acting portions to adjust a width of said slit, said thick members each having an integral, generally central, fulcrum portion in contact with the head.

4,984,534

METHOD FOR SYNTHESIS OF DIAMOND

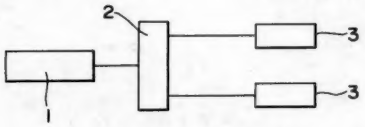
Toshimichi Ito; Masaaki Nosaka, and Ikuo Hosoya, all of Chiba, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 184,561, Apr. 21, 1988. This application Feb. 9, 1989, Ser. No. 308,087

Claims priority, application Japan, Apr. 22, 1987, 62-99118; May 2, 1987, 62-109193; Nov. 28, 1987, 62-301035

Int. Cl.[5] C23C *16/48*

U.S. Cl. 118—723 1 Claim



1. In an apparatus having a single microwave oscillator generator for synthesizing diamonds, the improvement comprising:

a branching wave guide for branching microwaves generated by the microwave oscillator generator, the branching wave guide having a receiving end and at least two branched ends, the receiving end being connected to the

microwave oscillator generator for receiving microwaves;

at least two reaction chambers, each reaction chamber being connected to a different branched end of said branching wave guide;

means for supplying a carbon source gas and hydrogen gas to each reaction chamber to be irradiated by said microwaves received from said branched wave guide, to produce a plasma; and

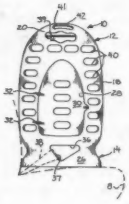
each of said reaction chambers having a substrate for depositing diamond.

4,984,535

PET CAGE

Judith E. White, South Bend, Ind., assignor to Allyssa Industries, Inc., South Bend, Ind.

Filed Sep. 19, 1989, Ser. No. 409,575
Int. Cl.[5] A01K *1/02*
U.S. Cl. 119—17 **5 Claims**



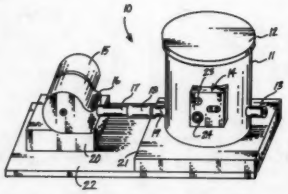
1. An animal cage comprising an integral housing and base, said housing including an outer side wall, a bottom wall, a top wall and an intermediate wall, said intermediate side and bottom walls defining an animal containment area, said outer side wall and said top wall including a plurality of openings therethrough for providing air flow into said animal containment area, an enlarged opening formed through said outer side wall constituting means for providing animal passage into and out of said containment area, said base being formed in one piece with said housing and extending below said housing bottom wall and defining openings therein that accommodate a vehicle seat belt, said housing bottom wall constituting a horizontal support for an animal, wherein said housing bottom wall isolates said vehicle seat belt from said containment area.

4,984,536

FISH FEEDING APPARATUS

James W. Powell, Box 24 White Bluff Rd., and James E. Powell, 3246 Hammett Rd., both of Hogansville, Ga. 30230

Filed Mar. 26, 1990, Ser. No. 500,529
Int. Cl.[5] A01K *61/02*
U.S. Cl. 119—51.04 **3 Claims**



1. A fish feeding apparatus comprising in combination,

an elongate vertically oriented bin mounted to a main support, the bin including an output conduit directed exteriorly of the bin, and

a feed conduit positioned within the bin in communication with the output conduit, and

an input conduit in communication with the feed conduit wherein the input conduit is directed exteriorly of the bin spaced from the output conduit, and

a blower means in communication with the input conduit for directing pressurized air into the input conduit and for pressurizing feed within the feed conduit to direct the feed and expel the feed through the output conduit, and

wherein the input conduit, the feed conduit, and the output conduit are defined by a single conduit, and

wherein the blower means includes an electric motor to drive an associated centrifugal blower and the motor is selectively operative through a timing mechanism to selectively actuate the motor to effect directing of pressurized air through the bin input conduit, and the centrifugal blower including a blower output conduit in an operative association with the bin input conduit, and

including a resilient coupler mounted between the blower output conduit and the bin input conduit to vibrationally isolate the blower output conduit from the bin output conduit, and

wherein the feed conduit includes a slotted top arcuate surface to receive metered feed within the feed conduit, and

wherein the blower means is mounted to a blower support and the bin is mounted to a bin support and the blower support and the bin support are each fixedly mounted to the main support to permit unitary positioning of the bin and blower means relative to an associated fish pond to selectively direct and distribute feed to the fish pond, and

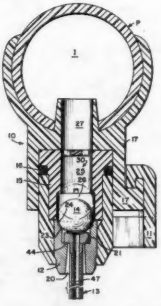
wherein the resilient coupler includes a secondary connector wherein the secondary connector pneumatically associates the blower with an aeration conduit, and the aeration conduit is directed interiorly of the bin underlying the feed conduit.

4,984,537

NIPPLE FOR FEEDING LIQUIDS TO FOWL AND/OR SMALL ANIMALS

Frederick W. Steudler, Jr., New Providence, Pa., assignor to Val Products, Inc., Bird-in-Hand, Pa.

Filed Sep. 1, 1989, Ser. No. 401,676
Int. Cl.[5] A01K *7/06*
U.S. Cl. 119—72.5 **16 Claims**



1. A nipple particularly adapted for feeding liquid to fowl and/or small animals comprising a housing including means for defining a passage through which liquid can pass, valve means in said passage for controlling the flow of liquid therethrough, said valve means includes a valve normally seated upon a first valve seat and closing said passage, a stem defined by a head and a pin, said head having an upper surface contiguous said

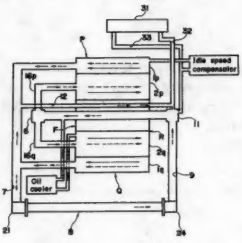
valve and being adapted to unseat said valve from said first valve seat upon actuation of said pin by a fowl or small animal, said pin having an end portion projecting out of said housing, said end portion including an end face, a bore through said stem extending between said upper surface and said end face, and means in said passage for underlyingly supporting said head for tilting movement upon lateral force application to said pin whereby water will selectively flow both through said bore and passage in proportion to a first lateral force applied to said pin in a first position of said pin and water will flow only through said passage past said first valve seat in proportion to a second lateral force less than the first lateral force applied to said pin in a second position of said pin.

4,984,538

COOLING SYSTEM FOR V-TYPE ENGINE

Seiji Nanba, Aki, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 21, 1989, Ser. No. 439,937
Claims priority, application Japan, Nov. 21, 1988, 63-294381
Int. Cl.[5] F01P *7/14*
U.S. Cl. 123—41.1 **22 Claims**



1. A cooling system for a V-type engine including an engine body in which a crankshaft is transversely disposed to extend in a transverse direction of a vehicle body and a pair of banks arranged in a "V" configuration are spaced from each other in a longitudinal direction of the vehicle body to define a V-shaped space therebetween which transversely extends along an axis of the crankshaft and continues upwardly of the engine body, said cooling system comprising:

a cross-flow type radiator arranged to extend substantially parallel of the engine body along the axis of the crankshaft and having a pair of tanks on opposite sides thereof spaced along the axis of the crankshaft;

a water pump mounted on one end of said engine body in the direction of the axis of the crankshaft;

a coolant inlet port formed at said one end of said engine body for supplying coolant from said water pump into said engine body;

a coolant outlet port formed at said one end of said engine body where said coolant inlet port is formed for discharging the coolant from said engine body;

a coolant return port provided at one said tank of said radiator adjacent to said water pump for receiving therethrough the coolant from said engine body;

a coolant supply port provided at the other said tank of said radiator that is isolated from said water pump for supplying the coolant to said engine body therethrough;

a suction line, positioned in said V-shaped space and extending from the other end of said engine body opposite to said one end thereof to said one end thereof along the axis of said crankshaft, for connecting said coolant supply port with said water pump to supply the coolant from said radiator to said water pump; and

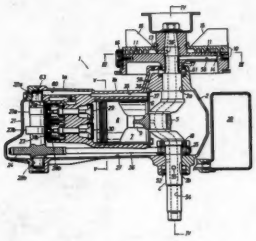
a coolant return line, arranged at the side of said one end of said engine body and extending at substantially a right angle to the axis of said crankshaft, for connecting said coolant outlet port with said coolant return port to return the coolant from said engine body to said radiator.

4,984,539

LIQUID COOLED INTERNAL COMBUSTION ENGINE

Akihisa Shinoda; Motohiro Fujita; Haruo Tsusaka; Makoto Yonezawa, and hiroyuki Nakano, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Apr. 26, 1990, Ser. No. 514,594
Claims priority, application Japan, May 15, 1989, 1-55531[U]; May 15, 1989, 1-55532[U]; May 15, 1989, 1-121169; May 15, 1989, 1-121170
Int. Cl.[5] F01P *3/00*
U.S. Cl. 123—41.42 **11 Claims**



1. A liquid cooled internal combustion engine, comprising:

an integrally cast engine main body including a cylinder block defining a cylinder bore extending laterally therein, a cylinder head disposed at a longitudinal end of said cylinder block, and a skirt extending from the other longitudinal end of said cylinder block;

a crankcase cover attached to an open end of said skirt to define a crankcase therein;

a crankshaft extending vertically in said crankcase and rotatably supported by said skirt at its both ends;

a piston slidably received in said cylinder bore to define a combustion chamber in cooperation with said cylinder head and said cylinder bore and coupled to a crank pin of said crankshaft via a connecting rod;

a camshaft rotatably supported by said cylinder head and extending in parallel with said crankshaft;

a timing belt passed around pulleys mounted on lower ends of said camshaft and said crankshaft, respectively, and extending in a belt chamber defined in said cylinder block along a lower side of said cylinder bore;

a cooling liquid jacket defined in said cylinder block along upper and lateral sides of said cylinder bore; and

cooling liquid supply means for circulating cooling liquid in said jacket and removing heat from said cooling liquid.

4,984,540

FUEL INJECTION CONTROL SYSTEM FOR A TWO-CYCLE ENGINE

Koji Morikawa, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1989, Ser. No. 373,934
Claims priority, application Japan, Jul. 21, 1988, 63-182718
Int. Cl.[5] F02D *41/14*; F02M *23/06*
U.S. Cl. 123—73 C **5 Claims**

1. In an air-fuel ratio control system for a two-cycle engine having a cylinder with a scavenge port and an exhaust port, an intake passage communicating with said scavenge port, an exhaust passage communicating with said exhaust port, a fuel injector directly injecting an amount of fuel and air into said cylinder, a scavenge pump i said intake passage for supplying compressed air into said cylinder through said scavenge port as scavenge air, and a throttle valve disposed in a bypass, around

said scavenge pump, of said intake passage, the improvement in the system comprising:

a feedback control for controlling the air-fuel ratio comprising:

means comprising an O_2-sensor having a linear characteristic provided in said exhaust passage for detecting actual air-fuel ratio in exhaust gases in which a part of the scavenge air is induced and for generating a corresponding actual air-fuel ratio signal;

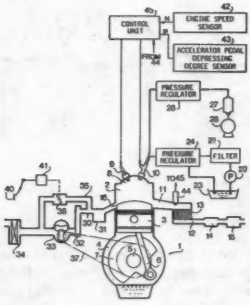
an engine speed sensor for detecting engine speed and for producing a corresponding engine speed signal;

an accelerator position sensor for detecting depressing degree of an accelerator pedal operatively connected with said throttle valve and for producing a corresponding degree signal;

calculating means responsive to said engine speed and degree signals for deriving a desired air-fuel ratio stored as a function of said engine speed and said depressing degree of said accelerator pedal and for producing a corresponding desired air-fuel ratio signal;

a comparator responsive to said actual air-fuel ratio signal and said desired air-fuel ratio signal for comparing said actual and said desired air-fuel ratios and for producing a correction signal when ratios are different in order to correct the amount of fuel or air to be injected into said cylinder; and

control means responsive to said correction signal for controlling the amount of fuel or air injected into said cylinder so as to immediately converge said actual air-fuel ratio to said desired air-fuel ratio, thereby stabilizing optimum combustion of the fuel in said cylinder and improving emission of said exhaust gases and controlability of said engine.



4,984,541

VALVE STEPPING DRIVE APPARATUS

Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Ceramics Research Institute Co., Ltd., Kanagawa, Japan

Filed Mar. 26, 1990, Ser. No. 498,640

Claims priority, application Japan, Mar. 30, 1989, 1-080130

Int. Cl.[5] F01L 9/04

U.S. Cl. 123—90.11 **7 Claims**

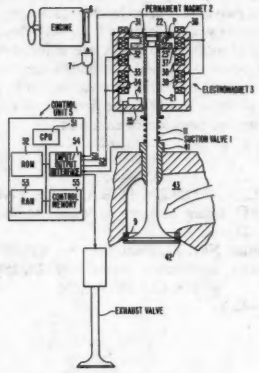
1. A valve stepping drive apparatus for driving a suction/exhaust valve of an engine by an electromagnetic force to open and close the valve, comprising:

a movable permanent magnetic connected to a suction/exhaust valve and having a pair of magnetic poles arranged in a direction in which the suction/exhaust valve is reciprocated;

fixed magnetic poles opposing the magnetic poles of said movable permanent magnet and arranged to have a spacing different from a spacing between the magnetic poles of said movable permanent magnet;

fixed excitation coils wound on respective ones of said fixed magnetic poles for exciting the fixed magnetic poles; and

energizing control means for controlling passage of current through said fixed excitation coils so that an electromagnetic force acts between the magnetic poles of said movable permanent magnet and the fixed magnetic poles, thereby driving the suction/exhaust valve to open and close the same.



4,984,542

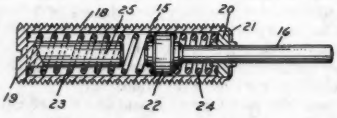
THERMAL THROTTLE ACTUATOR

Kenneth L. Rische, Canton; Roger D. Affeldt, Davisburg, and Edward A. Urbanek, Jr., Southgate, all of Mich., assignors to McGuane Industries, Auburn Hills, Mich.

Filed Aug. 24, 1989, Ser. No. 398,157

Int. Cl.[5] F02D 9/02

U.S. Cl. 123—179 G **7 Claims**



1. A thermal throttle actuator adapted to be mounted in an opening of a throttle body of an internal combustion engine wherein the fuel system is electronically controlled,

said thermal throttle actuator comprising,

a plunger mounted for reciprocating movement and adapted to contact a spring loaded throttle plate in the throttle body,

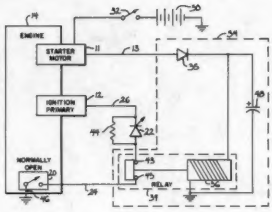
a bias spring yielding urging said plunger toward the throttle plate,

a shape memory alloy in the shape of a spring provided to produce a force on the plunger in a direction opposite to that of the bias spring when the shape memory alloy is heated to a temperature above a predetermined temperature, when the temperature is below the predetermined temperature, the bias spring functions to provide a force on the throttle plate which maintains the throttle plate in open position to facilitate cold starting of the engine.

4,984,543
OIL PRESSURE INTERLOCK SWITCH POWERED BY THE ENGINE STARTER

Paul A. Tharman, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Nov. 1, 1989, Ser. No. 430,566
Int. Cl.[5] F02P 11/02
U.S. Cl. 123—179 A 15 Claims



1. In an apparatus having an internal combustion engine, a starter motor for starting the engine, and a magneto-ignition system having a main core that includes a primary winding to produce an ignition pulse, and having a low oil pressure switch that activates when the engine oil pressure is below a predetermined level, the improvement comprising:

an interlock switch means for disabling said low oil pressure switch when the engine is not running, said interlock switch means being connected in circuit with both said starter motor and with said low oil pressure switch, said interlock switch means including:

a relay switch;

a diode having its anode connected in series with said starter motor;

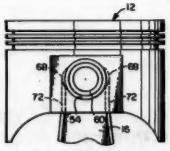
a capacitor connected in circuit with the cathode of said diode, said capacitor being charged by current from said starter motor during cranking of said engine and generating a discharge signal during its discharge cycle after said engine starts running; and

a first switch means, connected in circuit between said capacitor and said relay switch, for activating said relay switch in response to the discharge signal from said capacitor.

4,984,544
LUBRICATING MEANS FOR PIN CONNECTED RELATIVELY ROTATABLE ENGINE PART AND METHOD OF LUBRICATION

Richard L. DeBiasse, 8 Rockledge Trail, Chatham, N.J. 07928

Filed Nov. 29, 1989, Ser. No. 443,258
Int. Cl.[5] F02B 75/32
U.S. Cl. 123—197 AC 31 Claims



1. A lubricating configuration in an engine for a junction of relatively rotatable members in an environment where oil is available to be fed between the rotatable members, comprising

a relatively rotatable member provided with a bore; and

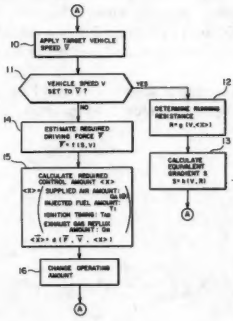
a member having a cylindrical bearing portion extending through said bore and snugly received therein so that rotation between the cylindrical portion and the relatively rotatable member may occur,

wherein at least one recess within the bore is provided spaced inwardly from both ends of the bore whereby a pocket is provided between the bore of the member and the cylindrical portion for accumulation of oil to lubricate between the surfaces of the cylindrical portion and the bore.

4,984,545
CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Masayoshi Kaneyasu, Hitachi, and Nobuo Kurihara, Hitachiota, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 19, 1989, Ser. No. 340,474
Claims priority, application Japan, Apr. 21, 1988, 63-96681
Int. Cl.[5] F02D 41/14; B60K 31/00
U.S. Cl. 123—399 21 Claims



1. A control system for the internal combustion engine, wherein operating elements are controlled by control means to control the operating conditions of the internal combustion engine to a target value set by target value setting means, the system comprising:

detection means for detecting the operating conditions of the internal combustion engine and the control conditions of the operating elements;

first calculation means for calculating a resistance index specifying a driving force corresponding to the operating conditions under prevailing load conditions from the control amount of the operating elements and the operating conditions of the internal combustion engine detected by the detection means;

second calculation means for calculating and supplying to the control means a control amount for control of the operating elements; and

memory means for storing information required for calculation by the first and second calculation means in such a way that the information is capable of being rewritten.

4,984,546
ENGINE CONTROL APPARATUS

Setsuhiro Shimomura; Seiji Wataya; Yukinobu Nishimura, and Satoru Okubo, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 363,661
Claims priority, application Japan, Jun. 8, 1988, 63-140996; Jul. 8, 1988, 63-171508
Int. Cl.[5] F02P 5/14; F02M 7/00
U.S. Cl. 123—425 2 Claims

1. An internal combustion engine control apparatus comprising:

an air-flow meter for measuring a suction air quantity Qa of an engine;

a suction pipe pressure sensor for detecting suction pipe pressure P_b of said engine;

a crank angle sensor for detecting the revolution angle θ of said engine;

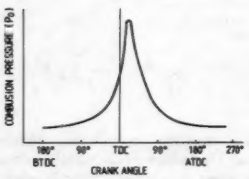
at least one cylinder internal pressure sensor for detecting combustion chamber pressure P_c of said engine; and

a control unit which comprises;

means for obtaining a fuel supply quantity Q_f and an ignition timing θi from an engine speed N and one of said suction air quantity Qa and said suction pipe pressure P_b;

means for obtaining at least one of maximum pressure value P_{max}, a mean effective pressure P_i, a first evaluation parameter $A=P_i(Qa/N)$ and a second evaluation parameter $B=P_i/P_b$, said maximum pressure P_{max} and said means effective pressure P_i being calculated from said combustion chamber pressure and said revolution angle θ_c for every combustion cycle, said first evaluation parameter A being calculated from said suction air quantity Q_a, said engine speed N and said mean effective pressure P_i, said second evaluation parameter B being calculated from said suction pipe pressure P_b and said mean effective pressure P_i; and

means for correcting at least one of said fuel supply quantity θ_f and said ignition timing θ_i to maximize said at least one



of said maximum pressure value P_{max}, said mean effective pressure P_i, and said first and second evaluation parameters A and B;

means for controlling one of a fuel supply quantity and an ignition timing on the basis of a corrected value obtaining from said correcting means; and

an exhaust sensor for detecting the component concentration of a combustion gas,

wherein said control unit further comprises means for obtaining an air-fuel ratio based on the component concentration of the combustion gas detected by said exhaust sensor, and means for performing a feedback control of said fuel supply quantity θ_f to set said air-fuel ratio to a predetermined value, said correcting means corrects said ignition timing θ_i to maximize said at least one of said maximum pressure value P_{max}, said mean effective pressure P_i, and said first and second evaluation parameters A and B; and

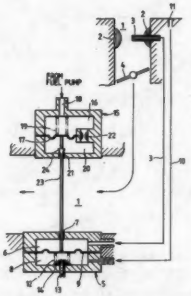
wherein in a predetermined load-operation range of said engine, said feedback control and the correlation of said ignition timing θ_i are executed whereas out of said load-operation range of said engine, said feedback control is stopped and said ignition timing θ_i is corrected to maximize at least one of said maximum pressure P_{max}, said mean effective pressure P_i and said first and second evaluation parameters A and B.

4,984,547

FUEL INJECTION SYSTEM FOR INJECTION CARBURETORS

Tetsuo Muraji, Odawara, Japan, assignor to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1989, Ser. No. 341,827
Claims priority, application Japan, Nov. 5, 1987, 62-169266
Int. Cl.[5] F02M *41/00*
U.S. Cl. 123—463 **6 Claims**



1. A fuel injection system for injection carburetors comprising:

an air section consisting of a depression chamber communicating with a venturi arranged in a suction tube and an air chamber communicating with the atmosphere, said chambers being separated from each other by a first diaphragm;

a fuel section consisting of a fuel chamber communicable with a fuel supply source and a fuel injection chamber having an opening communicable with said suction tube, said fuel section chambers being separated from each other by a second diaphragm and communicating with each other through an orifice;

a connecting member connected between said first diaphragm and said second diaphragm provided with an injection valve cooperable with said fuel chamber opening for injecting fuel into said suction tube;

first means for biasing said connecting member so as to displace said injection valve into an open position relative to said fuel chamber opening; and

second means for biasing said connecting member so as to displace said injection valve into a closed position relative to said fuel chamber opening and having a biasing force greater than that of said first biasing means;

wherein said air section and said fuel section are disposed in opposed relation relative to each other in the venturi region of the suction tube, and said depression chamber communicates directly with the atmosphere through an opening formed in said venturi.

4,984,548

FUEL INJECTOR RETAINER CLIP

Sharon J. Hudson, Jr., Lambertville, Mich., assignor to Sharon Manufacturing Company, Lambertville, Mich.

Filed Nov. 20, 1989, Ser. No. 438,858
Int. Cl.[5] F02M *55/02*
U.S. Cl. 123—470 **20 Claims**

1. A fuel rail assembly comprising: a plurality of fuel injectors each having a socket nose end, a fuel rail with a plurality of apertured fuel injector sockets for containing each of said socket nose ends respectively, and a plurality of injector re-

tainer spring members each clutching one of said nose ends of said injectors, said spring members each having a plurality

spring fingers projecting through a fuel port aperture in its respective socket to the interior of said fuel rail.

4,984,549

ELECTROMAGNETIC INJECTION VALVE

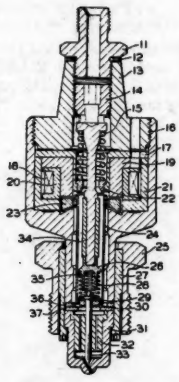
Gerhard Mesenich, Bochum, Fed. Rep. of Germany, assignor to Coltec Industries Inc., New York, N.Y.

Continuation of Ser. No. 706,162, Feb. 28, 1985, abandoned. This application Nov. 13, 1987, Ser. No. 120,638

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1984, 3408012

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—472 **27 Claims**



1. An electromagnetic valving assembly, comprising an electromagnet with armature and an armature-actuated valve member whose mass is much less than that of the armature and which is not fixedly connected with the armature so that the armature can exert a force on the valve member in one direction only, characterized in that before the start of an actuation cycle the armature is retained in the inoperative position by resilient restraining means, wherein the holding force of said restraining means is only a fraction of the saturation induction force of said electromagnet, wherein after overcoming said holding force said armature travels a major part of the armature stroke without causing said valve member to move in the direction of armature movement, and wherein only after traveling a major part of the armature stroke said armature impinges on said valve member at high speed and in so doing said armature moves said valve member in the direction of armature movement so that a substantial part of the work of opening said valve member is attained by the kinetic energy of said armature and of parts connected with said armature.

4,984,550

METHOD AND A DEVICE FOR FEEDING OF SPARK IGNITION ENGINES WITH A FUEL MEDIUM

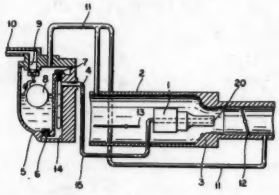
Zygmunt Toczyski; Stanislaw W. Kruczy ski; Henryk Frackiewicz; Janusz Lozi ski; Zdzislaw Chlopek; Wiktor Danilczyk; Jerzy Ranachowski; Janusz Janula, and Lech Wolski, all of Warsaw, Poland, assignors to Polska Akademia Nauk Instytut Podstawowych Problemow Techniki and Politechnikawarszawski, both of Warsaw, Poland

Filed Dec. 23, 1988, Ser. No. 290,319

Claims priority, application Poland, Dec. 29, 1987, 269773; Dec. 29, 1987, 269774

Int. Cl.[5] F02M *51/00*

U.S. Cl. 123—478 **13 Claims**



1. A method of feeding a fuel medium through a suction pipe to a cylinder in a spark ignition engine comprising ultrasonically injecting the fuel medium into the suction pipe at a point upstream of the cylinder by means of a transducer supplied from a tank containing the fuel medium, and controlling the rate of flow of the fuel medium in response to the absolute pressure of the fuel medium within the suction pipe, the absolute hydrostatic pressure of the medium supplied to the transducer, and by controlling the resistance to flow of the injected fuel medium within the suction pipe.

4,984,551

METHOD AND DEVICE FOR LAMBDA CONTROL WITH A PLURALITY OF PROBES

Winfried Moser, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

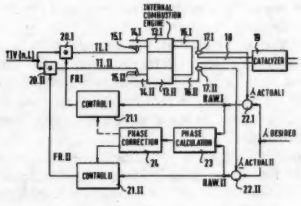
PCT No. PCT/DE89/00349, § 371 Date Feb. 26, 1990, § 102(e) Date Feb. 26, 1990, PCT Pub. No. WO89/12737, PCT Pub. Date Dec. 28, 1989

PCT Filed May 31, 1989, Ser. No. 473,934

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1988, 3821357

Int. Cl.[5] F02D *41/14*; G01N *27/50*; G05D *11/00*

U.S. Cl. 123—489 **8 Claims**



1. A method for controlling lambda in an internal combustion engine having at least two cylinder units and being equipped with at least two lambda probes in like positions

corresponding to respective ones of the cylinder units, the method comprising the steps of:

two-position controlling at least two air-fuel mixtures for respective ones of the cylinder units in at least two control circuits, respectively, wherein control oscillations are generated; and,

setting desired phase shifts between the control oscillations.

4,984,552

FUEL INJECTION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

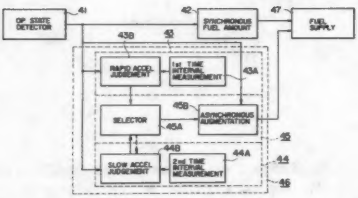
Hiroyuki Nishizawa, Kyoto; Kimito Kashiwabara, Kameoka; Osamu Nako, Okazaki; Mitsuaki Ishii, Itimeji; Kouichi Yamane, Himeji; Masaaki Miyazaki, Himeji, and Ryoji Nishiyama, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Mitsubishi Denki Ka bushiki Kaisha, both of Tokyo, Japan

Filed Jul. 5, 1989, Ser. No. 375,800

Claims priority, application Japan, Jul. 7, 1988, 63-169719

Int. Cl.[5] F02D *41/10*

U.S. Cl. 123—492 **6 Claims**



1. A fuel injection device for injecting a controlled amount of fuel to a cylinder of a spark ignition type internal combustion engine, said fuel injection device comprising:

operation state detector means for detecting an operations state of the internal combustion engine, said operation state detector means outputting at least one state parameter corresponding to the operation state of the internal combustion engine;

main fuel amount determining means, coupled to said operation state detector means, for determining, in accordance with a state parameter outputted from the operation state detector means, a main amount of fuel which is to be injected by the injection device;

first increment calculation means, coupled to an output of said operation state detector means, for calculating a first increment of a state parameter outputted from said operation state detector means, over each passage of a first length of time;

rapid acceleration state judgement means, coupled to said first increment calculation means, for detecting a rapid acceleration state of the internal combustion engine, wherein said rapid acceleration state judgement means compares said first increment of the state parameter with a first threshold level to detect the rapid acceleration state of the internal combustion engine;

second increment calculation means, coupled to an output of said operation state detector means, for calculating a second increment of said state parameter outputted from said operation state detector means, over each passage of a second length of time which is longer than said first length of time;

slow acceleration state judgement means, coupled to said second increment calculation means, for detecting a slow acceleration state of the internal combustion engine, wherein said slow acceleration state judgement means compares said second increment of the state parameter with a second threshold level to detect the slow acceleration state of the internal combustion engine;

augmentative fuel amount determining means, coupled to said first and second increment calculation means and said rapid and slow acceleration state judgement means, for calculating an augmentative amount of fuel, wherein said augmentative fuel amount determining means calculates an augmentative amount of fuel corresponding to said first increment of the state parameter when said rapid acceleration state judgement means detects the rapid acceleration state of the internal combustion engine, and calculates an augmentative amount of fuel corresponding to said second increment of the state parameter when the rapid acceleration state judgement means does not detect the rapid acceleration state of the internal combustion engine while the slow acceleration state judgement means detects the slow acceleration state of the internal combustion engine; and

fuel injector means, coupled to said main and augmentative fuel amount determining means, for injecting fuel to the internal combustion engine, an amount of injected fuel corresponding to the main amount of fuel determined by the main fuel amount determining means, or to the augmentative amount of fuel determined by the augmentative fuel amount determining means.

4,984,553

FUEL CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

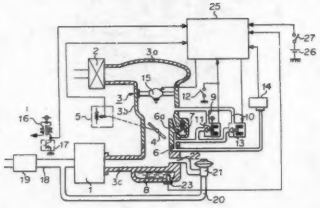
Hajime Kako, and Shinji Kojima, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1990, Ser. No. 520,934

Claims priority, application Japan, May 22, 1989, 1-129257

Int. Cl.[5] F02D *41/18*

U.S. Cl. 123—494 **2 Claims**



1. A fuel control apparatus for an internal combustion engine which comprises:

a pressure detecting means for detecting a pressure in a bypass air passage which bypasses a throttle valve in an air intake system for an internal combustion engine,

a first estimating means for estimating a value corresponding to the effective cross-sectional area of the bypass air passage,

a second estimating means for estimating a pressure in an intake air pipe of the air intake system on the basis of a pressure value detected by the pressure detecting means and an estimated value of effective cross-sectional area obtained by the first estimating means, and

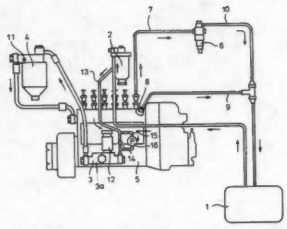
an operating means for calculating a fuel injection quantity on the basis of an estimated value of pressure in the intake air pipe which is obtained by the second estimating means.

4,984,554

AUTOMATIC AIR BLEEDING DEVICE FOR FUEL FEED SYSTEM OF DIESEL ENGINE

Masahiro Ariga; Saburou Takise, and Aturo Fujii, all of Hino, Japan, assignors to Hino Judosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1989, Ser. No. 410,406
Claims priority, application Japan, Oct. 17, 1988, 63-261229; Nov. 8, 1988, 63-281650; Nov. 21, 1988, 63-294368
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—516 2 Claims



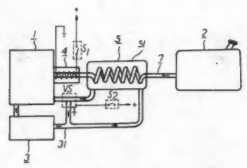
1. An automatic air bleeding device for a fuel feed system for supplying fuel to a diesel engine from a fuel supply tank comprising a check valve in a suction side line of a feed pump in the fuel feed system so as to permit fuel to flow only into said feed pump, a bypass line bypassing said check valve and a auxiliary pump in said bypass line selectively operable separately from said diesel engine for forcing aerated fuel through said fuel feed system back to said tank prior to the starting of said diesel engine.

4,984,555

DIESEL ENGINE FUEL PIPELINE HEATING DEVICE

Kuo-Liang Huang, 2fl. No. 27 Line 51 Hsin Tung St., Taipei, Taiwan

Filed Jul. 14, 1989, Ser. No. 380,815
Int. Cl.[5] F02M *31/00*
U.S. Cl. 123—545 5 Claims



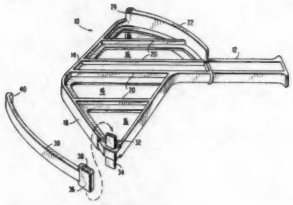
1. A diesel engine fuel pipeline heating device comprising:
an electric heating device provided on the exterior of the portion of the fuel pipeline proximate to the engine;
a fluid heating device heating device provided on the exterior of the fuel pipeline between said electric heating device and a fuel tank which supplies diesel fuel to the engine;
a valve for selectively feeding and diverting heated fluid through said fluid heating device heating device; and
a constant temperature switch for monitoring the temperature of the fluid passing through said fluid heating device heating device and causing the heated fluid to pass through said fluid heating device heating device only when the fluid temperature is a predetermined temperature and diverting the heated fluid at lower temperatures, whereby the diesel engine can be initially started by said electric heating device which heats the fuel in the pipeline to a desired temperature before starting the engine, and after the fluid has become heated said electric heating device can be disconnected and the fuel temperature in the pipeline is maintained by heated fluid selectively passing through said fluid heating device heating device by the actions of said valve and constant temperature switch.

4,984,556

DISK LAUNCHER

Henry G. Glass, P.O. Box 7553, Roanoke, Va. 24019, and Herbert G. Glass, 4402 S. Park, Dothan, Ala. 36301

Filed Jan. 27, 1989, Ser. No. 302,298
The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.
Int. Cl.[5] F41B *3/04*
U.S. Cl. 124—5 3 Claims



1. A disk and disk launcher comprising a disk having at least one peripheral recess, said disk launcher comprising
a handle,
a flat head portion extending outwardly from one end of the handle and disposed in a common plane with said handle,
disk support means disposed along one end of the head portion on one side of the axis of said handle and projecting perpendicular to said plane an equal distance on opposite sides of said plane,
an elongated flexible member detachably connected to said head portion and having a free end extending outwardly from a flex point on said head portion on the opposite side of said axis, and
a pair of identical attachment means disposed opposite each other on opposite surfaces of said flat head portion at said flex point to which said flexible member may be selectively and detachably connected and
projecting means on the free end of said flexible member adapted to cooperate with said recess on said disk for engaging said disk and imparting a spinning action to said disk as the disk leaves the launcher upon flexing of the flexible member about said flex point under the action of centrifugal force imparted thereto.

4,984,557

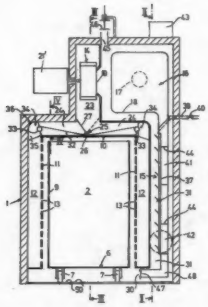
BAKING OVEN

Helmut König, Rotomoosweg 15, A-8045 Graz, Austria

PCT No. PCT/AT87/00028, § 371 Date Oct. 18, 1988, § 102(e) Date Oct. 18, 1988, PCT Pub. No. WO87/06101, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 15, 1987, Ser. No. 294,570
Claims priority, application Austria, Apr. 18, 1986, 1038/86
Int. Cl.[5] A21B *1/00*; F24C *15/32*
U.S. Cl. 126—21 A 9 Claims

1. A baking oven comprising baking chamber means defining a baking chamber (2) including a front wall having in access door therein and a pair of opposite side partition walls (11) each having a plurality of air passage openings (13) therein, said baking chamber (2) being adapted for receiving therein a carriage (6) carrying baking goods for carrying out a baking process during which said carriage (6) is maintained in a substantially station disposition in said baking chamber (2), means defining a pair of air channels (12), one of said air chan-

nels (12) extending along each of said side partition walls (11), said air channels (12) extending substantially along the entire effective height of said baking chamber (2) and communicating with said baking chamber (2) through said air passage openings (13), blower means (14) for receiving a return air stream and for discharging a corresponding air inlet stream, means for controlling the flow of said air inlet stream so that it alternatively passes into one or the other of said air channels (12) and then into said baking chamber (2), return channel means (31) communicating with said baking chamber (2) through a suction opening (30) located adjacent the lower end of said baking chamber (2) for withdrawing said return air stream from said baking chamber (2) and for returning it to said blower means



(14), heater means (16) for heating said return air stream before it passes into said blower means (14) and humidifier means (15) for humidifying said return air stream before it passes into said heater means (16), said blower means (14) and said heater means (16) being disposed at elevations which are higher than the upper extremity of said baking chamber (2) and being located at least partially directly above said baking chamber (2), said humidifier means (15) being disposed laterally of said baking chamber (2) at an elevation which is above said suction opening (30) but below said heater means (16) and being coextensive in a longitudinal direction of said return channel means (31) with a portion thereof so that said return air stream streams around said humidifier means is aid longitudinal direction.

4,984,558

LARGE-BURNER STOVE WITH HIGH HEAT EXHAUST DUCTING

Yuk L. Lok, 33-39 73rd St. Jackson Heights, Queens, N.Y. 11372

Filed Feb. 16, 1990, Ser. No. 480,913
Int. Cl.[5] F24C *3/00*
U.S. Cl. 126—39 R **18 Claims**

1. A stove suitable for large-burner cooking generating a high heat exhaust comprising:

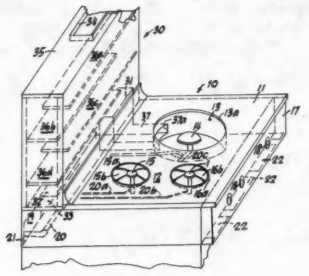
an enclosed stove casing having walls defining a horizontal upper surface used as a cooking surface and a hollow interior;

a burner well extending into the interior of said stove casing and having an upper annular rim at said horizontal upper surface, said annular rim defining a support on which a cooking vessel is placed for cooking and being dimensioned such that the cooking vessel substantially closes off said well from exposure at said horizontal upper surface;

a burner recessed at an interior position in said well in the interior of said casing which provides a flame to a bottom portion of the cooking vessel; and

ducting means including a first duct member positioned at a rear portion of said stove casing remote from said burner well and a second duct member having an opening located adjacent said interior position of said well and another opening communicating into said first duct member for conveying high heat exhaust from said burner into said first duct member at said rear portion of said stove casing,

wherein said burner well has vertically oriented cylindrical walls circumferentially surrounding said burner which are



lined with a refractory material to insulate the stove casing from the heat from said burner in said well, and

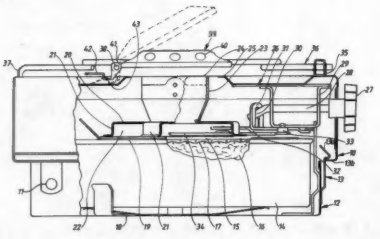
wherein said second duct member extends through said cylindrical walls and liner material and communicates into said burner well with its second opening positioned adjacent said burner.

4,984,559

SPIRIT STOVE

Tom J. Bennet, Haverdal, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Nov. 14, 1989, Ser. No. 436,417
Claims priority, application Sweden, Nov. 15, 1988, 8804115
Int. Cl.[5] F24C *5/00*
U.S. Cl. 126—43 **7 Claims**



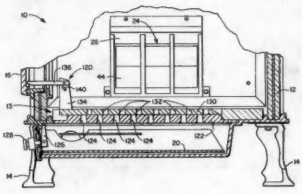
1. In a spirit stove or the like comprising a fuel container (14) having an opening (15) through which fuel is poured into the container and through which fuel combustion by-products leave during burning, a burner tube (23) which is placed above the opening, and a flame spreader (39) which is situated above the burner tube, the improvement wherein the flame spreader is pivotally secured to the spirit stove and can be brought from a first, mainly horizontal position, in which it covers the opening (24) of the burner tube, to a second position in which a slot is formed between the flame spreader and the burner tube which slot is sufficiently large enough to admit an igniter to be inserted down into the burner tube at the same time as the flame spreader in the said second position still generally covers the opening of the burner tube.

4,984,560

LOW EMISSIONS WOOD BURNING STOVE

Gary M. Hazard, Morristown, Vt., assignor to N.H.C., Inc., Morrisville, Vt.

Division of Ser. No. 229,270, Aug. 8, 1988, Pat. No. 4,862,869.
This application Aug. 28, 1989, Ser. No. 399,237
Int. Cl.[5] F23H *11/20*
U.S. Cl. 126—169 **6 Claims**



1. A wood burning stove comprising:

firebox means for forming a chamber for primary combustion of fuel received therein;

door means comprising a door which may be opened and closed for selectively accessing said firebox means;

stationary grate means defining a first series of openings located in fixed position below said firebox means;

ash pan means comprising an ash pan disposed below said stationary grate means for receiving ashes from said firebox means;

moveable grate means defining a second series of openings, said moveable grate means being mounted above said stationary grate means and positionable between a first position wherein said first series of openings does not communicate with said second series of openings and a second position wherein said first series of openings communicate with said second series of openings to provide communication between said chamber and said ash pan means; and

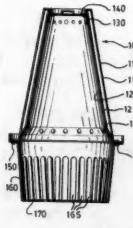
handle means connected to said moveable grate means for engagement from exteriorly of said firebox means for transforming said moveable grate means from said first position to said second position and engageable with said door so that when said door is closed, said moveable grate means is forced to the first position.

4,984,561

CONTAINER FOR DISPOSING WASTE

Jack E. Warrington, Toronto, Canada, assignor to Green Cone Inc, Ontario, Canada

Filed Dec. 16, 1988, Ser. No. 285,016
Int. Cl.[5] F24J *2/00*
U.S. Cl. 126—417 **36 Claims**



1. A container for disposing of waste, comprising:

a lower portion, said lower portion having a plurality of water permeable passages formed therein;

an upper portion removably engaged to said lower portion to define an enclosure for retaining said waste in the container, said upper portion including solar radiation collection means for heating said enclosure, said solar radiation collection means comprising an inner wall and an outer wall in spaced radiation thereby forming a solar collection chamber, said inner wall comprising means to permit air circulation to occur between said solar collection chamber and said enclosure; and

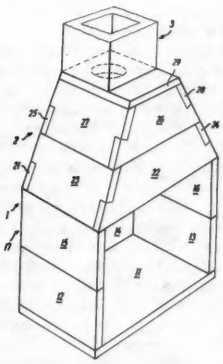
closure means provided in said upper portion.

4,984,562

SMOKE CHAMBER FOR FIREPLACE

Gunnar Pedersen, Bjergvej 75, DK-7280 Sonder Felding, and Flemming Norgard, Haderup, both of Denmark, assignors to Gunnar Pedersen, Haderup, Denmark

Filed Aug. 3, 1989, Ser. No. 389,372
Claims priority, application Denmark, Aug. 5, 1988, 63-4384
Int. Cl.[5] F24B *1/18*
U.S. Cl. 126—500 **12 Claims**



1. A smoke chamber for a fireplace and adapted to convert the load from a superimposed chimney having a horizontal cross section different from that of an underlying burning chamber to an essentially vertical load on the burning chamber, which smoke chamber comprises a pair of opposing inclined walls joined to a pair of opposing substantially vertical walls wherein

(a) said vertical walls comprise opposing substantially vertical supporting elements each having (1) opposing inclined side edge surfaces extending upwardly and inwardly, each having a recess therein providing a support surface thereon and (2) opposing substantially horizontal top and bottom edge surfaces;

(b) said inclined walls comprise opposing inclined supporting elements each having (1) opposing substantially horizontal top and bottom edge surfaces and (2) opposing side edge surfaces, each having a recess providing an abutment surface thereon which abuts against a corresponding support surface;

(c) so that said smoke chamber acts to transfer the weight of said chimney to the walls of said burning chambers.

4,984,563

MULTIPLE FUNCTION OBSERVATION AND TREATMENT ENDOSCOPE AND PREPARATION PROCESS

Croisy Renaud, 15 Rue Marignac, Geneve/CH, France

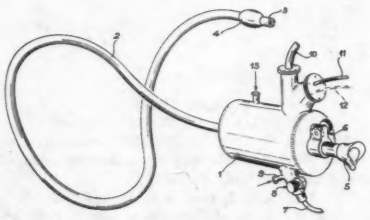
PCT No. PCT/FR88/00340, § 371 Date Feb. 16, 1990, § 102(e) Date Feb. 16, 1990, PCT Pub. No. WO89/00023, PCT Pub. Date Jan. 12, 1989

PCT Filed Jun. 27, 1988, Ser. No. 333,624

Claims priority, application Switzerland, Jun. 29, 1987, 2453/87

Int. Cl.[5] A61B *1/00*

U.S. Cl. 128—6 4 Claims



1. Multifunction observation and treatment endoscopic apparatus for introduction into the human body through a natural or artifical internal duct, which comprises:

a cylindrical synthetic material tube serving as a catheter and extending between an externally controlled observation head and an internal end provided with an inflatable fixing ballon, said tube including a plurality of cylindrical longitudinal hollow duct for respectively receiving illuminating means, observation means and treatment means, wherein the tube has an external diameter of less than 2 mm and wherein the hollow ducts are separated from one another by walls which, at the location of their minimum thickness, have a size of less than 0.10 mm,

said illuminating means including a plurality of ultrafine optical fibres with an individual diameter of approximately 50 μm distributed and embedded in the tube,

said observation means including an optical fibre, having an end provided with optical accommodation means and having an observation side end which includes a screw and rack system for permitting axial displacement of the fibre within the tube, a fibre which is regulatable in axial translation within the tube; a screw and rack system fixed to the observation head for regulating said fibre in axial translation within the tube wherein a radial clearance is provided between the tube and said fibre to permit the circulation of a cooling liquid along the same and a hollow channel with a diameter of substantially 1 mm for the circulation of a liquid and the introduction, as a function of instantaneous needs of the surgeon, of random operating means.

4,984,564

SURGICAL RETRACTOR DEVICE

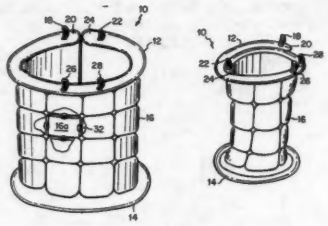
Frank Yuen, 110-20 71st Avenue, Forest Hills, N.Y. 11375

Filed Sep. 27, 1989, Ser. No. 413,266

Int. Cl.[5] A61B *17/02*

U.S. Cl. 128—20 12 Claims

1. A surgical retractor device comprising an inflatable sleeve that is deflated, when not in use, so as to assume a precoiled position; and is inflated by air pressure, when in use, so as to



assume an uncoiled state in which it defines a generally circular aperture.

4,984,565

EXTRACORPOREAL LITHOTRIPTOR WITH X-RAY LOCATING SYSTEM

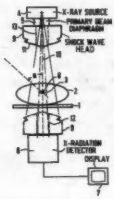
Manfred Rattner, Grossenseebach, and Franz Plisek, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 26, 1989, Ser. No. 426,967

Claims priority, application European Pat. Off., Dec. 9, 1988, 88120646.0

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—24 OEL 5 Claims



1. An extracorporeal lithotriptor comprising:

an x-ray locating means adapted for locating a calculus in a patient, said x-ray locating means including means for generating an x-ray beam propagating in a propagation direction and having a central ray; and

a shockwave head including means for generating shockwaves and means adapted for coupling said shockwaves to said patient for in situ disintegration of said calculus, said shockwave head being disposed in said x-ray beam so that said central ray of said x-ray locating means proceeds substantially centrally through said shockwave head.

4,984,566

ORTHOPEDIC CASTING TAPE

Takayuki Sekine, Kawaguchi, and Naomitsu Takekawa, Tokyo, both of Japan, assignors to Tokyo Eizai Laboratory Co., Ltd., Japan

Filed Sep. 6, 1989, Ser. No. 403,600

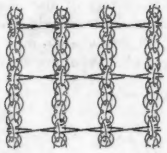
Claims priority, application Japan, Sep. 7, 1988, 63-224990

Int. Cl.[5] A61F *5/04*

U.S. Cl. 128—90 13 Claims

1. An orthopedic casting tape comprising a fibrous substrate impregnated with synthetic resin, which fibrous substrate is knitted with non-elastomeric organic synthetic fiber stretch yarns in which singles yarns are paralleled, twisted and heat treated in said twisted form and wherein the twist imparted to

said paralleled singles yarns in which singles yarns are paralleled, twisted and heat treated in said twisted form and wherein the twist imparted to said paralleled singles yarns reverse to



the original twist of each twisted singles yarn and said reverse twisted yarns are thereafter retwisted to a similar and opposite level.

4,984,567

APPARATUS FOR MEASURING INTRACRANIAL PRESSURE

Naoki Kageyama, Kyoto; Hiroji Kuchiwaki, Aichi; Junki Ito, 1-12, Harayamadai, Seto-shi, Aichi 489; Nobumitsu Sakuma, and Yukio Ogura, both of Ibaraki, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo and Hiroji Kuchiwaki, Aichi, both of, Japan

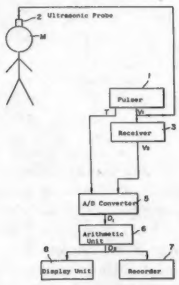
PCT No. PCT/JP87/00705, § 371 Date Apr. 17, 1989, § 102(e) Date Apr. 17, 1989, PCT Pub. No. WO88/02234, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 25, 1987, Ser. No. 350,705

Claims priority, application Japan, Sep. 27, 1986, 61-227139

Int. Cl.[5] A61B *8/00*

U.S. Cl. 128—660.02 **2 Claims**



1. In an apparatus for measuring intracranial pressure, including an electrocardiograph for detecting a heartbeat of a living body having a cranium, a pulser means for generating a voltage pulse using the heartbeat detected by the electrocardiograph as a trigger, an ultrasonic probe means for receiving the voltage pulse generated by the pulser means and for transmitting an ultrasonic pulse into the cranium of the body from the outside thereof and for receiving an echo of an incident wave therefrom, a receiver means for amplifying the received echo and for providing an output corresponding thereto, a processor means for processing the output of the receiver means comprising:

an A/D converter means for digitizing discrete values of a waveform of the echo received by the probe means and for providing an output corresponding thereto; and

an arithmetic means for extracting from the output of the A/D converter means a range including a reflection wave from dura mater of a certain thickness contained within the cranium, and for determining a time difference between element waves from a quefrency value obtained through frequency analysis of the extracted range by an arithmetic algorithm of a cepstrum method so as to calculate the thickness of the dura mater, and for comparing the calculated dura mater thickness with a previously measured reference value so as to calculate a dura mater distortion factor having a correlation with an intracranial pressure within the cranium.

4,984,568

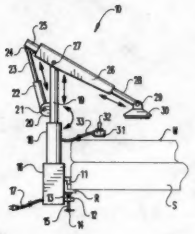
BACK MASSAGING DEVICE

Harvey Persaud, 14508 Stonebridge View Dr., Gaithersburg, Md. 20878

Filed Oct. 12, 1989, Ser. No. 420,477

Int. Cl.[5] A61H *15/00, 23/00*

U.S. Cl. 128—51 **3 Claims**



1. A back massaging device, comprising:

a base;

clamp means for securing said base to a bed frame rail;

a vertical column mounted on said base for reciprocal axial movement and reciprocal rotational movement about a longitudinal axis of said vertical column;

means for axially moving said vertical column;

means for rotating said vertical column;

a transverse arm pivotally mounted at an upper end of said vertical column;

a hydraulic piston and cylinder assembly having a first end pivotally connected to said vertical column and a second end pivotally connected to said transverse arm for pivoting said transverse arm about a horizontal axis;

an actuating rod mounted for reciprocal linear movement parallel with said transverse arm;

means for linearly moving said actuating rod;

a massaging implement pivotally secured on a distal end of said actuating rod;

said transverse arm being pivotally mounted to said vertical column at a point disposed between said massaging implement and said hydraulic piston and cylinder assembly;

a remotely actuated lotion dispenser in said massaging implement; and

programmed control means for moving said vertical column, said transverse arm and said actuating rod to move said massaging implement over programmed contours of an individual's back.

4,984,569

MASSAGING APPARATUS

Ten-An Liu, No. 44, Long-Hwa Street, Shou-Kung District, Kaohsiung, Taiwan

Filed May 16, 1990, Ser. No. 523,904

Int. Cl.[5] A61H *15/00*

U.S. Cl. 128—57 **5 Claims**

1. A massaging apparatus comprising: a supporting frame;

a driving means including an electric motor mounted on the supporting frame and a transmission device;

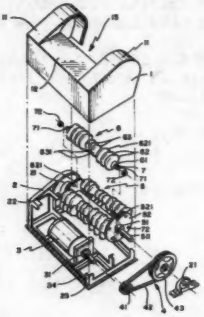
a drum rotatably and eccentrically mounted to the support-

ing frame and adapted to be driven by said driving means, said drum including:

(i) two flanges spaced apart from each other;

(ii) a plurality of shafts evenly fitted between two flanges and spaced at equal intervals about the circumference thereof;

(iii) a plurality of ridges coaxially and integrally formed on the shafts; and a cover means for housing the supporting



frame having a pair of symmetric side covers for housing side portions of the supporting frame and a horizontal top plate extending substantially tangentially towards the drum and interconnecting the side covers, said top plate coacting with the side covers to define an opening which exposes continously an upper portion adjacent to the top plate of the cover means and a side portion to an user to be treated.

4,984,570

KNITTED HYDROPHOBIC WEB WOUND DRESSING

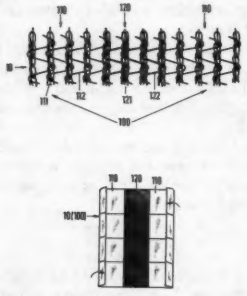
Günter Langen, Wolfstein, and Harald Jung, Kreimbach-Kaulb, both of Fed. Rep. of Germany, assignors to Karl Otto Braun KG, Wolfstein, Fed. Rep. of Germany

Continuation of Ser. No. 41,678, Apr. 21, 1987, abandoned. This application Sep. 14, 1989, Ser. No. 408,411

Claims priority, application European Pat. Off., Apr. 22, 1986, 86105530.9

Int. Cl.[5] A61L *15/00*; A61F *13/00, 15/00*

U.S. Cl. 128—156 **11 Claims**



1. A comprising a broad-width knitted or raschel-knitted web (100) of absorbent, hydrophilic cellulosic spun yarns (111, 112), a strip-like web section (120) of hydrophobic man-made fibers of synthetic polymers having a high surface tension interconnected to the knitted by looping within a plane, wherein the strip-like web section (120) is formed as central strip in the web (100) of knitted fabric (10), the knitted web and the strip-like web section being folded so as to form a wound pad (200) such that the web section (120) of the hydrophobic man-made fibers, as hydrophobic covering layer (210), forms the wound pad and layers of cellulosic spun yarns are located behind the web section to form absorbent layers (220, 221, 222, 223), wherein the diameters of the absorbent, hydrophilic cellulosic yarns and the hydrophobic man-made fibers range between 10 tex and 40 tex, wherein monofilaments, multifilament yarns and staple fiber yarns are used as the hydrophobic man-made yarns.

4,984,571

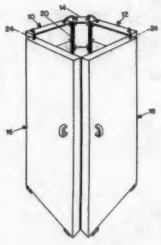
COLLAPSIBLE TANNING BOOTH

Jack F. Springer, Jr., Fort Edward; Timothy S. Smith, Queensbury; Cathy A. Cloutier, Glens Falls; Ben A. Marcantonio, South Glens Falls, and Richard A. Willis, Hudson Falls, all of N.Y., assignors to KVR Manufacturing Corp., Hudson Falls, N.Y.

Filed Jun. 22, 1989, Ser. No. 370,337

Int. Cl.[5] A61N *5/06*

U.S. Cl. 128—371 **4 Claims**



1. A collapsible tanning booth comprising at least two rear lamp units and at least two front lamp units, each of the lamp units having a thin long casing that includes rear, side, top and bottom walls and a front panel, the front panel being of a material transmissive to ultraviolet light, a reflector panel adjacent the rear wall and lamps mounted between the reflector panel and the front panel, the rear lamp units being arranged side by side and the front units being arranged side by side, first hinge means joining the rear lamp units together along adjacent side walls of the casing thereof for articulation relative to each other between a storage configuration in which they are substantially aligned transversely and a use configuration in which they are oblique transversely to each other, second hinge means joining each laterally outermost front unit along a laterally outermost side wall thereof to a laterally outermost side wall of a corresponding laterally outermost rear lamp unit so that the front units can be moved between a storage configuration in which they reside face to face against the rear lamp units and a use configuration in which they are disposed oblique to the rear lamp units and to each other, two adjacent front lamp units, however, being unattached to each other to enable pivotal movement of such units about the second hinge means apart from each other to provide an opening for access by a person to a space defined by the units in their use configuration, and roller support means on the bottom walls of the casings of all of the units for supporting the units on a floor for rolling movements thereof between the storage configuration and use configuration.

4,984,572

HEMODYNAMICALLY RESPONSIVE SYSTEM FOR AND METHOD OF TREATING A MALFUNCTIONING HEART

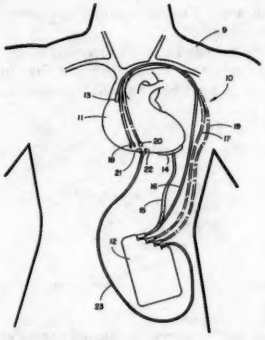
Todd J. Cohen, Mountain View, Calif., assignor to Leonard Bloom, Towson, Md., a part interest

Continuation-in-part of Ser. No. 233,367, Aug. 18, 1988, which is a continuation-in-part of Ser. No. 105,030, Oct. 6, 1987, Pat. No. 4,774,950. This application Jul. 27, 1989, Ser. No. 385,544

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 D 48 Claims



1. In a system for treating a malfunctioning heart of the type which includes storage means for storing electrical energy, electrode means for electrically coupling the storage means to the heart, determining means for determining at least one hemodynamic parameter, means for providing a first signal representative of baseline level for the parameter, means responsive to output from the determining means for developing a second signal representing current level of the parameter over a period of given duration, and means responsive to output from the means for providing the first signal and output from the means for developing the second signal for charging and enabling discharge of the electrical energy stored by the storage means across the electrode means upon change in the current level of the parameter of at least a predetermined amount from the representative baseline level for the parameter.

4,984,573

METHOD OF ELECTRON SPIN RESONANCE ENHANCED MAGNETIC RESONANCE IMAGING

Ib Leunbach, Dragör, Denmark, assignor to Hafslund Nycomed Innovation AB, Malvroe, Sweden

PCT No. PCT/GB88/00479, § 371 Date Dec. 23, 1988, § 102(e) Date Dec. 23, 1988, PCT Pub. No. WO88/10419, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 22, 1988, Ser. No. 295,031

Claims priority, application United Kingdom, Jun. 23, 1987, 8714615; Jun. 24, 1987, 8714804

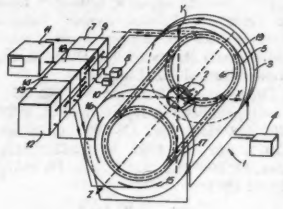
Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653 17 Claims

1. A method of generating a magnetic resonance image of a sample, said method comprising:

introducing into said sample a contrast comprising a paramagnetic material having an electron spin resonance transition having a linewidth of 1 Gauss or less;

exposing said sample to a first radiation of a frequency selected to excite nuclear spin transitions in selective nuclei in said sample and exposing said sample to a second radiation of a frequency which excites spin transitions coupled to nuclear spin transitions of at least some nuclei, said second radiation being of a frequency selected to excite said electron spin resonance transition of said paramagnetic material; detecting free induction decay signals from said sample; and generating therefrom a magnetic resonance image of said sample.



4,984,574

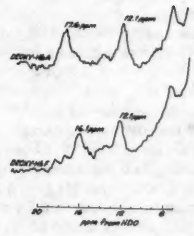
NONINVASIVE FETAL OXYGEN MONITOR USING NMR

Seth Goldberg, 630 First Avenue (Apt. 14J), New York, N.Y. 10016, and Jonothan L. Logan, Birch Hill Rd., R.D. 1, Box 2480, Westford, Vt. 05494

Filed Nov. 23, 1988, Ser. No. 275,447

Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653 A 8 Claims



1. A method of determining the oxygenation level of an animal which comprises:

(a) obtaining an NMR spectrum originating in the hemoglobin molecules of the animal;

(b) determining the amplitude of a nuclear magnetic resonance (NMR) signal from said NMR spectrum which originates in a nucleus within the hemoglobin molecules of the animal and which has a chemical shift characteristic of the hemoglobin oxygenation level;

(c) determining the amplitude of an NMR signal from said NMR spectrum which originates in a nucleus within the hemoglobin molecules of the animal and which has a chemical shift independent of the hemoglobin molecule oxygenation level; and

(d) determining a ratio of the first determined amplitude from step (b), to the second determined amplitude from step (c), the ratio constituting a measure of the oxygenation level of the animal.

4,984,575

THERAPEUTICAL APPARATUS OF EXTRACORPOREAL TYPE

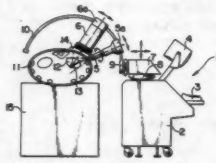
Naoki Uchiyama; Takashi Tsukaya; Kouichiro Ishihara; Sakae Takehana; Tetsumaru Kubota; Syuichi Takayama; Akira Taniguchi; Nobuhiko Watanabe; Naomi Sekino; Hiroki Hibino, and Masaaki Hayashi, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Apr. 18, 1988, Ser. No. 182,785

Claims priority, application Japan, Apr. 16, 1987, 62-94870; Apr. 17, 1987, 62-94583; Apr. 25, 1987, 62-102809; Apr. 27, 1987, 62-102071; Apr. 28, 1987, 62-105637; May 20, 1987, 62-124838; Jun. 18, 1987, 62-152777; Jun. 19, 1987, 62-153163; Jun. 22, 1987, 62-155749

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—660.03 2 Claims



1. An extracorporeal therapeutic apparatus, comprising:

locating means for locating the position of a target to be treated within a patient, said locating means generating and using ultrasonic waves;

therapeutic energy generating means for generating and focussing therapeutic energy upon said target to be treated; and

guiding and supporting means for movably guiding and supporting said locating means and said therapeutic energy generating means such that said locating means and said therapeutic energy generating means can be separately and independently guided to desired positions with respect to the surface of said patient, said guiding and supporting means being displaceable over said surface of said patient, wherein said guiding and supporting means includes: (a) a body which is movable toward and away from said patient; (b) a guide arm means for positioning said locating means at a desired angle for observation and for positioning said therapeutic energy generating means at a desired angle for efficient shock wave emission; (c) a head for supporting said guide arm means, said head being mounted on said body; and (d) means for rotating said head with respect to said body and for raising and lowering said head with respect to said body; and wherein said guide arm means includes a semicircular section and a horizontal support shaft, said support shaft being rotatably connected to said head such that said semicircular section can be positioned above and below said patient.

4,984,576

CIRCUITRY FOR HEARTBEAT

Andreas Schulenberg, Schönaich, and Martin Schraag, Sindelfingen, both of Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 148,205, Jan. 19, 1988, abandoned, which is a continuation of Ser. No. 85,267, Aug. 11, 1987, abandoned, which is a continuation of Ser. No. 867,346, May 23, 1986, abandoned. This application Nov. 2, 1989, Ser. No. 431,723

Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3518967

Int. Cl.[5] A61B *8/02*

U.S. Cl. 128—661.07 8 Claims

1. Apparatus for detecting the location of a fetal heartbeat, comprising

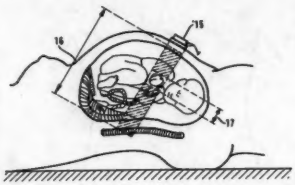
transmitter means for launching ultrasound pulses of a given carrier frequency,

transducing means for converting reflections of launched ultrasound pulses into corresponding electrical waves,

a normally inoperative processing channel having an input coupled to said transducing means, said processing channel having means for providing a first signal at an output thereof that represents the strength of Doppler signals applied to the input of said channel from said transducing means,

a normally inoperative comparison channel having an input coupled to said transducing means, said comparison channel having means for providing a second signal at an output thereof that corresponds to the strength of Doppler signals applied to the input of said channel from said transducing means,

control means for making said processing channel operative to produce said first signal during a first time window after a pulse is launched by said transmitting means and



for making said comparison channel operative to produce said second signal during a second time window after said pulse is launched by said transmitting means, said time windows being displaced from each other so that the signals respectively passing through said channels are from different but overlapping depth ranges,

a comparison means coupled to said channels for providing at an output thereof a signal indicating which channel has the stronger Doppler signal, thus indicating which depth range gives a better match with the location of the fetal heart, and

means responsive to the comparison means output signal for stepwise shortening of the depth ranges corresponding to the time windows of the processing and comparison channels down to predetermined minimum depth ranges such that after a number of steps an optimum match of the location of the fetal heart with the depth range corresponding to the processing channel is achieved even if the fetal heart changes its location in depth.

4,984,577

OSCILLOMETRIC NON-INVASIVE METHOD FOR MEASURING BLOOD PRESSURE AND APPARATUS FOR AUTOMATED OSCILLOMETRIC BLOOD PRESSURE MEASURING

Michael Frankenreiter, Sindelfringen, Fed. Rep. of Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 20, 1989, Ser. No. 326,147

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—681 12 Claims

1. An oscillometric non-invasive method for measuring blood pressure, comprising the steps of:

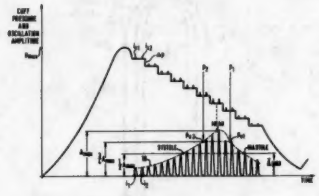
(a) applying a blood pressure cuff about a subject's limb containing an artery;

(b) inflating said cuff to a cuff pressure above the systolic blood pressure of said artery, therby occluding said artery;

(c) reducing said cuff pressure step by step, thereby permitting an increasing flow through the progressively less occluded artery;

(d) monitoring arterial counterpressure oscillations at each cuff pressure reducing step;

(e) converting said counterpressure oscillations to voltage signals;
(f) processing said voltage signals into a sequence of peak amplitudes enveloped by an envelope;
(g) evaluating at least two points p_{e1} and p_{e2} on said envelope, the first point p_{e1} disposed within an area of a decreasing branch of said envelope, said area corresponding to situations wherein the contact between said cuff and



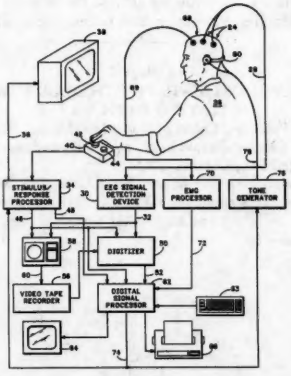
said limb is sufficiently strong for obtaining correct peak amplitudes, the second point p_{e2} disposed on an increasing branch of said envelope;
(h) determining at least two cuff pressure values, said pressure values including values p_1 and p_2 corresponding respectively to said points p_{e1} and p_{e2}; and
(i) determining mean, systolic, and diastolic pressures using said at least cuff pressure values p_1 and p_2.

4,984,578

METHOD AND APPARATUS FOR IDENTIFYING AND ALLEVIATING SEMANTIC MEMORY DEFICIENCIES

William Keppel, 11640 S.W. Boones Ferry Rd., Portland, Oreg. 97219, and Kenneth R. Erickson, 21414 S.W. Martinazzi Ave., Tualatin, Oreg. 97062

Division of Ser. No. 271,164, Nov. 14, 1988. This application May 7, 1990, Ser. No. 519,952
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—732 **11 Claims**



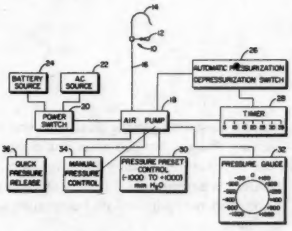
1. An apparatus for training a subject to improve the subject's ability to perform a semantic memory task, comprising:
(a) detection means for detecting the electroencephalogram signal from the scalp of said subject to produce a signal representative of evoked response potentials;
(b) display means for displaying symbols to a subject in a predetermined manner;
(c) input means for receiving from said subject a signal representative of whether said subject ascribes meanings to the symbol;
(d) measurement means for measuring the amplitude of the most positive-going peak of said evoked response potential signal during the 270–550 ms period following the display of a given signal; and
(e) feedback means for providing to said subject a signal indicative of said amplitude.

4,984,579

APPARATUS FOR TREATMENT OF SENSORINEURAL HEARING LOSS, VERTIGO, TINNITUS AND AURAL FULLNESS

Paul H. Burgert, 611 W. Harvard, Glenwood Springs, Colo. 81601; Richard L. Goode, 121 Giffen, Los Altos, Calif. 94022, and Terry L. Burke, 404 Park Dr., Glenwood Springs, Colo. 81601

Filed Jul. 21, 1989, Ser. No. 383,078
Int. Cl.[5] A61B *15/00*
U.S. Cl. 128—747 **16 Claims**



1. A portable ear device for modulating air pressure in the ear canal of a patient which can be conveniently carried by the patient, comprising:
an ear probe;
air pressure changing means connected to said ear probe for inducing air pressure changes in the ear(s) of the patient;
activating means for activating said pressure changing means;
air pressure control means for controlling the pressure produced by said pressure changing means to produce a preset pressure level in said ear(s); and
timer means for controlling the duration during which said pressure changing means produces said pressure at the preset pressure level in the ear(s) upon said pressure changing means being activated.

4,984,580

BLOOD DRAWING APPARATUS

Thomas Wanamaker, R.R. #2, P.O. Box 619, Kansas City, Mo. 64111

Division of Ser. No. 854,171, Apr. 21, 1986, Pat. No. 4,841,985. This application Jan. 17, 1989, Ser. No. 297,613
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—763 **4 Claims**

1. A fluid collection system comprising:
a double-ended cannula structure open at both ends and having a bore for passage of fluid therethrough;
a holder having means therein for releasably mounting the cannula structure with one end extending forwardly for venipuncture and the other end extending rearwardly for coupling with a collection container, said mounting means comprising:
housing means for receiving a portion of said structure therein; and
user-operable locking means for releasably engaging said cannula structure upon insertion of said structure in said housing means, said engagement maintaining said can-

nula structure in said housing means during use said locking means comprising:

female means associated with said cannula structure for receiving a complementary male element comprising:

a hub intermediate said ends of said structure for insertion in said housing means;

a slot in said hub for reception of said complementary male element therein;

male means including said male element for engagement with said slot, said male means comprising:

a locking ring comprising first and second opposed locking flanges for presenting said male element;

means for mounting said locking ring within said holder, whereupon said flanges engage said slot upon said reception of said structure in said housing means;

means for moving said locking flanges to a spaced-apart relationship out of said slot, whereby to release said cannula structure from said housing means.

4,984,581

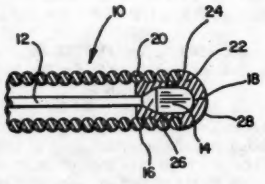
FLEXIBLE GUIDE HAVING TWO-WAY SHAPE MEMORY ALLOY

James D. Stice, Minneapolis, Minn., assignor to Flexmedics Corporation, Minneapolis, Minn.

Filed Oct. 12, 1988, Ser. No. 256,658

Int. Cl.[5] A61B 5/00

U.S. Cl. 128—772 **12 Claims**



1. A guidewire comprising an elongated, flexible core of a shape memory alloy which is changeable between a pseudoelastic austenitic phase structure and a pseudoelastic R-phase structure, the austenitic and R-phase structures having different predetermined corresponding core shapes, the core being selectively changeable between said phase structures in response to a thermal stimulus to impart tip-deflecting movement to the guidewire.

4,984,582

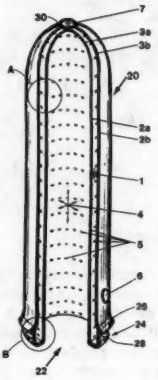
VACUUM ASSISTED CONDOM APPLICATOR

Gregory Romaniszyn, and Eva Romaniszyn, both of 339 Cornwall Drive, Fort McMurray, Alberta, Canada T9K 1C6

Filed May 31, 1990, Ser. No. 531,147

Int. Cl.[5] A61F 6/04

U.S. Cl. 128—844 **5 Claims**



1. A condom applicator comprising:

a housing having an open end and an opposite closed end, said housing including an inner wall and an outer wall spaced from each other along a substantial portion of their length and interconnected to define an internal space therebetween, said inner wall including a plurality of holes to communicate the internal space with an interior of the housing,

sealing means for sealing said internal space after said internal space has been evacuated to maintain a vacuum in the internal space by stretching a condom located in the housing against the inner wall of the housing to block said plurality of holes with the condom, and

air inlet means for allowing air into the internal space so as to overcome the vacuum and release the condom.

4,984,583

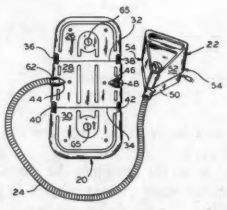
AIR BUBBLING MATS FOR THERAPEUTICALLY AGITATING BATH WATER

Samuel F. Peterson, Chicago; Ronald O. Hilger, Elmhurst, and William Kalnins, Maple Park, all of Ill., assignors to Associated Mills, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 67,490, Jun. 26, 1987, abandoned. This application Jan. 26, 1988, Ser. No. 149,110

Int. Cl.[5] A61H 9/00

U.S. Cl. 128—66 **15 Claims**



1. An air bubbling bath arrangement comprising a portable air pump, said air pump including a housing having a motor

section and a water collecting compartment below said motor section, a spill way formed in said water compartment to drain all water away from said compartment before said water can rise as high as said motor section, an elongated foldable air mat made of a plurality of sections which are hinged together, said hinged sections folding for storage or opening to fit a bathtub, an air line hose extending from a lower side region of said air pump housing to a central point of one of said sections and on an edge at the side of said air mat, said air line hose being coupled into said lower side region of said housing in order to retain portability while greatly reducing the likelihood of said air pump tipping over if said air line hose is pulled, and a check valve in said air line hose to preclude a back flow of a liquid from said air bubbling mat through said air lines hose to said air pump, wherein said air mat comprises at least three sections with air passageways formed therein, said sections being hinged together to form two opposite ends and a center section, and convoluted flexible hose means extending between said sections to bridge said air passageways at locations where the sections are hinged together, thereby providing communication between said air passageways formed in said mat sections.

4,984,584

HIGH ELASTIC MODULUS BANDAGE

Paul E. Hansen, Lake Elmo, and Christopher J. Libbey, St. Joseph, both of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.

Continuation of Ser. No. 443,012, Nov. 28, 1989, abandoned, which is a continuation of Ser. No. 206,565, Jun. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 186,675, Apr. 21, 1988, abandoned, which is a continuation of Ser. No. 3,779, Jan. 16, 1987, abandoned. This application May 8, 1990, Ser. No. 520,114

Int. Cl.[5] **A61F** *13/06, 13/08;* **B32B** *5/04;* **B68C** *5/00*

U.S. Cl. 128—898 **10 Claims**

1. A cohesive bandage comprising a series of spaced elastic yarns between coextensive thin non-woven fibrous cover webs, the bandage being uniformly impregnated throughout and bonded together in a unified structure with a polymeric binder having a basis weight at least equal to the basis weight of the cover webs, said yarns being maintained under tension in said unified structure,and wherein said elastic yarns are from about 550 to about 1700 denier and are uniformly spaced at about 15 to 25 yarns per inch of width with the proviso that the product of the denier times the number of yarns per inch of width is from about 10,000 to about 25,000; said cohesive bandage being further characterized by the ratio of the elastic modulus F_{125} value to the elastic modulus F_{50} value being less than about 10.

10. A method of providing support and/or compressive force to a mammalian limb comprising applying a bandage of claim 1 to the limb in a manner to provide said support and/or compressive force.

4,984,585

TISSUE EXPANDER

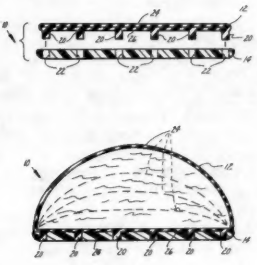
Eric D. Austad, 309 Riverview Dr., Ann Arbor, Mich. 48104

Continuation of Ser. No. 467,115, Feb. 17, 1983, abandoned. This application Feb. 26, 1990, Ser. No. 484,867

Int. Cl.[5] **A61B** *19/00*

U.S. Cl. 128—899 **4 Claims**

1. A low profile expandable device for implantation beneath the skin and subcutaneous layers which, in situ, is progressively expanded in volume by the introduction of fluid, said low profile expandable device comprising a relatively rigid and generally planar base and an expansible envelope on said base, said expansible envelope defining the expansion volume, said expansible envelope being disposed essentially flat against the base and substantially free of overfolds when in its initial unexpanded condition so as to facilitate its implant in a patient, said envelope consisting of a material which is expansible by stretching such that as fluid is progressively introduced into



the device, the envelope stretches to apply expansion force over substantially the entire undersurface of overlying skin and subcutaneous layers during all stages of the expansion procedure, said envelope comprising a double thickness of said material overlying said base, and means securing one of said double thicknesses to said base, said means securing one of said double thicknesses to said base comprising projections on said one thickness and apertures in said base with said projections being lodged within said apertures.

4,984,586

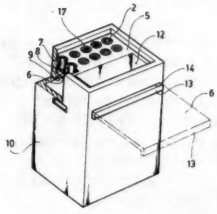
ASHTRAY HAVING CIGARETTE SNUFFING DEVICE

Lee Nae-Won, 6/2,90,Moonhak-Dong, Nam-Ku,Incheon, Rep. of Korea

Filed Sep. 25, 1989, Ser. No. 411,993

Int. Cl.[5] **A24F** *13/18*

U.S. Cl. 131—256 **9 Claims**



1. A combination cigarette snuffing device and ashtray, comprising:

an ashtray body having an open top, a closed bottom, and first, second, third, and fourth side walls, said first side wall having an elongated slit formed therein which is at a height that separates an upper portion of said ashtray body from a lower portion of said ashtray body, said second side wall being positioned opposite to said first side wall, and said second side wall having receiving means formed on an interior surface of said second side wall;

a snuffer member affixed to said ashtray body and positioned within the upper portion of said ashtray body, and said snuffer member including at least one snuffer tube; and

a plate insertable into said slit and having a forward edge

releasably receivable within said receiving means, said plate dimensioned and arranged such that said forward edge is slidable between said first and second side walls, and said plate having a portion which has width which is essentially equal to the distance between said third and fourth side walls and said portion having a length which is sufficient to extend between said first and second side walls such that the lower portion of said ashtray body is essentially sealed off from the upper portion of said ashtray body when the forward edge of said plate is received within said receiving means.

4,984,587

ROTARY CYLINDER DRYER AND METHOD OF DRYING TOBACCO PRODUCTS

Richard E. G. Neville, Salisbury, England, assignor to GBE International PLC, Andover, England

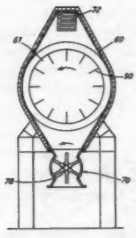
PCT No. PCT/GB89/00286, § 371 Date Nov. 13, 1989, § 102(e) Date Nov. 13, 1989, PCT Pub. No. WO89/08407, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 17, 1989, Ser. No. 435,370

Claims priority, application United Kingdom, Mar. 19, 1988, 8806597

Int. Cl.[5] A24B *3/04*

U.S. Cl. 131—305 14 Claims



1. A rotary dryer for tobacco products comprising:
(a) a cylinder arranged for rotation about an inclined axis;
(b) means for feeding tobacco into one end of the drying cylinder;
(c) means for conveying dried tobacco from the other end of the drying cylinder;
(d) heating means arranged to heat the cylinder;
(e) a housing arranged to contain the drying cylinder and sealed to be substantially airtight;
(f) means for maintaining an atmosphere of superheated steam in the drying cylinder; and
(g) means for reducing the pressure in the drying cylinder below atmospheric pressure.

4,984,588

LOW DELIVERY CIGARETTE

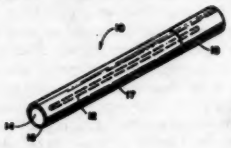
Lawrence L. Stewart, Jr., Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,486

Int. Cl.[5] A24D *1/00, 3/04*

U.S. Cl. 131—364 8 Claims

1. A smoking article comprising:
a cylinder of smoking material;
a filter attached to said cylinder of smoking material; and
a tube of heat fusible material extending from near one end of said smoking material, to the junction of said smoking material and said filter, said tube being open at both ends for conveying virtually unfiltered, undiluted smoke the length of said tube, said tube extending through the junction of said filter and said cylinder of smoking material and into said filter.



4,984,589

WRAPPER FOR SMOKING ARTICLE

Walter Riedesser, Neustadt, Fed. Rep. of Germany, assignor to Julius Glatz GmbH

Filed Nov. 30, 1989, Ser. No. 444,036

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1988, 3840329; European Pat. Off., Sep. 20, 1989, 89117395

Int. Cl.[5] A24D *1/02*

U.S. Cl. 131—365 17 Claims

1. Wrapper for an article to be smoked, such as a self-extinguishing cigarette, formed from cellulose, comprising filler materials, possibly including burn promoting salts, wherein the improvement comprises that the wrapper includes at least two paper layers comprising a cover layer (1) and an inner layer (2) laminated together, said wrapper comprises

said wrapper comprises	
area weight	20–60 g/m^2
said cover layer (1) comprises	
[area weight	20–60 g/m^2]
raw density	0.5–0.9 g/cm^3
air permeability	10–250 CU (Coresta Units)
filler material content	10–60%
burn promoting salt content	0–5%

and the inner layer (2) comprises:

area weight	6–12 g/m^2
raw density	0.7–1 g/cm^3
air permeability	0–12 CU (Coresta units).

4,984,590

HAIR STYLING COMB

Stephen R. Bachtell, 807 S. Hi-Lusi, Mt. Prospect, Ill. 60056

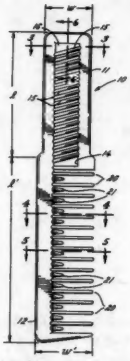
Continuation-in-part of Ser. No. 9,353, Jan. 30, 1987, abandoned. This application Apr. 7, 1989, Ser. No. 334,903

Int. Cl.[5] A45D *24/02*

U.S. Cl. 132—161 10 Claims

1. A comb for grooming hair having full body comprising a handle portion, a straight elongated tooth support portion extending from said handle portion along a straight longitudinal axis, a first set of teeth extending in a direction transverse

to said tooth support portion and disposed in a straight row, said teeth of said first set having straight sides and being of substantially uniform length of about one inch and spaced uniformly at intervals of about one fourth inch so that upon passage through hair the teeth of said first set channel the hair without substantial resistance and without adversely affecting the body of the hair, a second set of uniformly spaced teeth extending in a direction transverse to said tooth support portion, said teeth of said second set each being disposed between a pair of teeth of said first set and having straight sides and a discrete length which is no greater than one fourth of the length of the teeth of said first set such that when the teeth of said second set are passed through the hair a relatively small drag is created on the hair to permit controlled contouring thereof, and said teeth of said second set each having tapered configuration with relatively narrowed ends and being spaced from adjacent teeth of said first set by about one eighth inch.

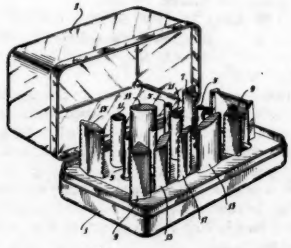


4,984,591

ORTHOGONALLY ASYMMETRIC GEOMETRIC HAIR ROLLERS

Gerald M. Jacobi, Pomona, N.Y., assignor to Conair Corporation, Stamford, Conn.

Filed Jun. 20, 1988, Ser. No. 209,207
Int. Cl.[5] A45D *4/00, 2/12*
U.S. Cl. 132—229 **5 Claims**



1. A hair setter unit for providing unusual forms of hair curling, said hair setter including

a base and a plurality of heating posts on said base,

a plurality of hair rollers having axial bores therein and fitting about said heating posts, and

said rollers having surfaces defining orthogonally asymmetrical cross-sections, said surfaces intersecting at intersections parallel to the axes of said bores, and at least one of said intersections having spaced teeth thereon,

whereby said heating posts may be more compactly spaced.

4,984,592

MANICURE SHIELD

Christine Hellein, R.D. 1, Box 136C, Hopwood, Pa. 15445

Filed Dec. 18, 1989, Ser. No. 451,644
Int. Cl.[5] A45D *29/00*
U.S. Cl. 132—285 **1 Claim**

1. A manicure shield comprising,

an elongate convex shield, and

pivot means formed at a rear portion of the shield to pivotally mount the shield to an upper ring underlying the shield, the upper ring including a lower ring for securement of the shield to an individual's finger, and

wherein the convex shield is transparent, and

wherein the upper ring is of a relatively rigid first material and the lower ring is formed of a resilient material to enable resilient securement of the manicure shield to the individual's finger, and

further including a flexible tab member integrally secured to an upper surface of the upper ring, and the resilient tab in engagement with a rear convex side surface of the shield to maintain the shield in a lowered position, and the flexible tab cooperates with a bottom surface of the shield to maintain the shield in a raised position, and

wherein the pivot means includes a plurality of parallel legs integrally secured to rear side edges of the shield and further including a pivot axle directed through each leg wherein each pivot axle is aligned relative to one another and directed orthogonally through the upper ring to pivotally mount the convex shield to the upper ring, and

wherein the upper and lower rings are defined by an axis "A" with the convex shield orthogonally oriented to the axis when the shield is in a raised first position, and parallel to axis "A" when the shield is in a lowered second position, and

wherein the lower ring is defined by a plurality of encircling legs spaced apart at their lower terminal ends and defined by interior surfaces clad with a cushioned layer.

4,984,593

METHOD AND APPARATUS FOR CLEANING FREIGHT CONTAINERS AS WELL AS FOR TREATING AND CIRCULATING THE FLUIDS USED

Heikki Ahonen, Painontie 25, 37630 Valkeakoski, Finland

Filed May 19, 1988, Ser. No. 195,887
Claims priority, application Finland, May 22, 1987, 872279
Int. Cl.[5] B08B *3/10*
U.S. Cl. 134—13 **14 Claims**

1. A method for cleaning freight containers and for treating and circulating the liquids used in the cleaning operation, which comprises:

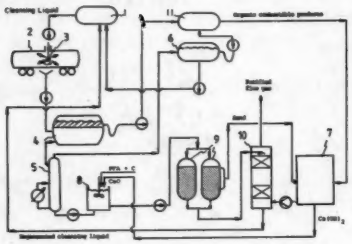
(a) using an aqueous solution containing soda as a cleansing liquid in a cleansing operating in a freight container,

(b) separating the resulting organic volatile compounds and substances lighter than water, if any, from said cleansing

liquid used in the cleansing operation of step (a) to form a first liquid,

(c) treating said first liquid obtained from step (b) with lime or calcium hydroxide and with a product which contains activated carbon to form a slurry,

(d) filtering said slurry obtained from step (c), so as to retain solids therefrom in a filter and so as to collect a filtrate,



(e) subjecting the solids retained in said filter to combustion in order to remove organic impurities and carbon,

(f) treating the filtrate of step (d) with flue gases formed during the combustion in step (e) in order to convert sodium hydroxide in said filtrate back to sodium carbonate and so as to form a second liquid, and

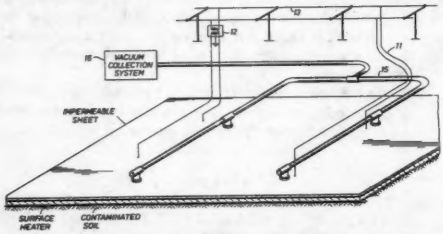
(g) circulating said second liquid obtained from step (f) and using it again as cleansing liquid in step (a).

4,984,594

VACUUM METHOD FOR REMOVING SOIL CONTAMINATION UTILIZING SURFACE ELECTRICAL HEATING

Harold J. Vinegar, and George L. Stegemeier, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 27, 1989, Ser. No. 427,418
Int. Cl.[5] B08B *13/00, 15/00*
U.S. Cl. 134—21 **26 Claims**



1. A method for remediation and decontamination of surface and near-surface soils comprising:

placing an electric surface heater on the soil surface;

placing a permeable mat above the surface heater;

placing an impermeable sheet above the permeable mat;

applying a vacuum to the soil through an opening in the impermeable sheet;

heating the soil by thermal conduction with the surface heater;

vaporizing the contaminants in the soil; and

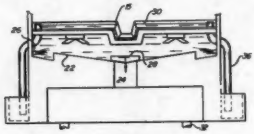
recovering contaminants from the soil through a vacuum collection system.

4,984,595

CLEANING ARRANGEMENT AND METHOD FOR PAINT SPRAY BOOTH

Leif E. B. Josefsson, Sterling Heights, Mich., assignor to Flakt, Inc., Madison Heights, Mich.

Filed May 4, 1989, Ser. No. 347,508
Int. Cl.[5] B08B *3/08*
U.S. Cl. 134—38 **4 Claims**



1. A method for cleaning a perforate floor and a sub-floor structure overlying a paint overspray scrubber of a paint spray booth enclosure comprising the steps of:

blocking any drains and openings near the floor of the booth;

blocking off the paint overspray scrubber with a blocking device to isolate the scrubber from the perforate floor and the subfloor structure;

injecting a cleaning solution into the booth to flood the floor and sub-floor structure with the cleaning solution;

allowing the cleaning solution to soak on the floor and sub-floor structure for a period of time sufficient to produce a self-cleaning effect thereon;

removing the blocking device from the paint overspray scrubber and allowing the cleaning solution to drain into the scrubber so that the scrubber itself may be cleaned; and

draining the cleaning solution and any accompanying overspray matter removed by the self-cleaning effect from the booth by unblocking the drains near the floor of the booth.

4,984,596

OPERATING DEVICE FOR A DISH-WASHER

Jan A. N. Westfelt, Huskvarna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Sep. 18, 1989, Ser. No. 408,709
Claims priority, application Sweden, Sep. 22, 1988, 8803361
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—58.0 DL **3 Claims**

1. In a dishwasher having a wash cycle, a tub defining a washer chamber, said tub being disposed within a frame and enclosed by a cabinet, a door provided with a receptacle adapted to contain dishwashing detergent, said receptacle having an opening which faces said washing chamber when said door is in its closed position, said receptacle being covered by a lid prior to and during an initial stage of said wash cycle, an electric means having a movement, said lid being released by said electric means,

an operating device, comprising:

said electric means disposed in association with said washing chamber;

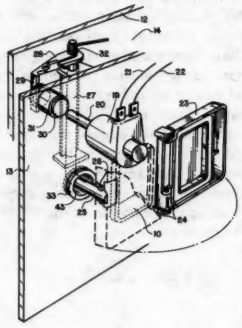
a mechanical means for transferring said movement from said electric means to said lid when said door is in its closed position whereby said lid is released, said mechanical means being disposed within said door;

said lid being under the tension of a spring and being moved

to a closed position in which it is retained by a lock means, said lock means releasing said lid when said mechanical means transfers said movement from said electric means to said lid;

said washing chamber being surrounded by a flange which sealingly cooperates with said door, said flange defining a boundary along its perimeter having an inside and an outside, said receptacle and said lid being situated inside said boundary when said door is in its closed position;

said electric means comprising an electromagnet and a movable core situated on the outside of said boundary, said movable core being substantially perpendicular to said door when said door is in its closed position;



said mechanical means comprising a shaft movable coaxially with said movable core; and

said mechanical means including a rod turnable about a vertical axis when said door in its closed position, one end of said rod being shaped as a hook and extending into said washing chamber, said hook cooperating with a projection on said lid whereby said lid is locked in a closed position, the opposite end of said rod being provided with a follower having an arm, said arm being placed in the path of movement of said shaft, said shaft being acted upon by said movable core when said electric means is activated.

4,984,597

APPARATUS FOR RINSING AND DRYING SURFACES

Christopher F. McConnell, West Chester, and Alan E. Walter, Exton, both of Pa., assignors to CFM Technologies Research Associates, Lionville, Pa.

Division of Ser. No. 184,544, Apr. 20, 1988, Pat. No. 4,911,761, which is a continuation-in-part of Ser. No. 765,294, Aug. 13, 1985, Pat. No. 4,778,532, which is a continuation-in-part of Ser. No. 747,894, Jun. 24, 1985, Pat. No. 4,633,893, which is a continuation-in-part of Ser. No. 612,355, May 21, 1984, Pat. No. 4,577,650. This application Nov. 3, 1989, Ser. No. 431,268

Int. Cl.[5] B08B *3/04*

U.S. Cl. 134—95 **20 Claims**

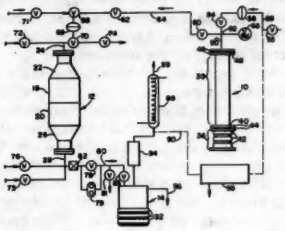
1. Apparatus for rinsing and drying the surfaces of objects comprising:

(a) vessel means for supporting said objects for contact with rinsing fluid and drying vapor;

(b) inlet means in fluid communication with said vessel means for allowing said drying vapor to flow into said vessel means;

(c) outlet means in fluid communication with said vessel means for allowing said rinsing fluid and said drying vapor to flow out of said vessel means; and

(d) means for controlling the rate of flow of rinsing fluid out of said outlet means of said vessel and drying vapor into said inlet means of said vessel to replace said rinsing fluid, such that substantially no liquid droplets are left on the



surfaces after replacement of the rinsing fluid with drying vapor.

4,984,598

SYSTEM FOR WORKING ON THE PRIMARY PIPEWORK AND WATER BOX OF A NUCLEAR POWER STATION STEAM GENERATOR

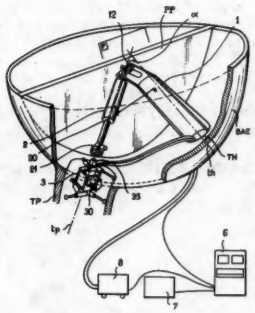
Antoine Gemma, Meudon, France, assignor to Electricite de France (Service National), Paris, France

Filed Jan. 26, 1988, Ser. No. 148,589

Claims priority, application France, Jan. 28, 1987, 87 00994

Int. Cl.[5] B08B *1/00*

U.S. Cl. 134—166 R **24 Claims**



24. A system for working on a primary pipework and on a water box having a manhole for accessing the interior confines of the primary pipework of nuclear power station steam generators, comprising:

a removable vehicle mechanically fastened to a tensioner cable travelling, during displacement of the removable vehicle in the primary pipework, over direction-changing pulleys, the tensioner cable being paid out from a balancer winder situated in the vicinity of the free end of an insertable member outside the manhole when said insertable member is in position,

said insertable member being comprised of a first member and a second member,

said first member having a substantially elongate shape and forming a first arm of the system,

said second member having a substantially elongate shape, articulated at one end to an end of the first member, said second member forming a second arm of the system, and the combination of the first and second arms being adapted to be inserted into the water box of the steam generator through the manhole and said second member being adapted to be placed in a deployed position relative to the first member,

said vehicle mounted on said second arm and being mobile relative to it,

working means carried by said vehicle, the working means being, by virtue of its movement relative to said second arm and its relative angular displacement between the first and second arms, adapted to reach a plurality of areas of the internal surface of the steam generator,

remote control means for the vehicle and the work means,

said water box has a partition plate and to provide for work such as decontamination of the partition plate of the water box of the steam generator, said second member forming said second arm is articulated to the first arm by a universal joint type articulation, said articulation comprising, in the operative position, a first axis substantially parallel to the partition plate and a second axis substantially perpendicular to the partition plate, said vehicle being mounted to be mobile in translation along said second arm, and

wherein to provide for holding said second arm on and moving it over the partition plate said second arm comprises a central first actuator being disposed in the vicinity of the articulation and being provided with a fixing sucker, said first central actuator serving to fix the combination constituted by the first and second arms in translation in the direction perpendicular to the partition plate, and

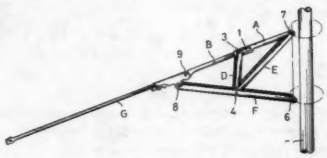
a plurality of actuators disposed at the free end of the second arm, at least two opposed actuators forming an assembly mobile relative to said second arm being displaceable perpendicularly to the longitudinal direction of the second arm in a direction parallel to the partition plate to procure the corresponding displacement of said second arm, the axis perpendicular to the partition plate forming an axis of rotation, relative to the fixed point formed by the central actuator, the plurality of actuators having piston rods and being provided at the end of the piston rods with a sucker adapted to be fixed by depressurization.

4,984,599

FORDING FRAMES OF AN UMBRELLA

Wen C. Hwang, 2F, No. 9, Alley 23, Lane 135, Si-Ta Rd., Hsin-chu, Taiwan

Filed Jun. 22, 1989, Ser. No. 370,189
Int. Cl.[5] A45B *19/00*
U.S. Cl. 135—25 R **1 Claim**



1. An umbrella frame which, in an open position, smoothly and continuously supports a covering material thereon, comprising:

a pulling frame member (A) having a first length, a first end and a second end with a sliding hole (1) in said second end having a second length and extending part of the first length of said pulling frame member;

a sliding frame member (D) having first and second ends and a third length between said first and second ends;

a pushing frame member (B) having first and second ends, said first end of said pushing frame member being pivotally connected at a first connection (3) to said first end of said sliding frame member, said first connection being slidably engaged in said sliding hole of said pulling frame member;

a lower frame member (F) having first and second end, the second end of the sliding frame member being pivotally connected at a second connection (4) to said lower frame member at an intermediate position between said first and second ends of said lower frame member, the second ends of said lower frame member, said pushing frame member being pivotally connected to each other;

an upper frame member (E) having a first end pivotally connected at a third connection (7) to said first end of said pushing frame member, said upper frame member having a second end pivotally connected at said second connection to said sliding frame member and to said lower frame member, said upper frame member having a fourth length between said first and second ends of said upper frame member which is equal to the first length plus the third length minus the second length;

said frame having an open position with said first connection at an outer end of said sliding hole adjacent said second end of said pulling frame member and said sliding frame member, said pulling frame member and upper frame member forming a triangle, said pushing frame member and said pulling frame member extending in a substantially smooth continuous fashion for continuously supporting a covering material of an umbrella having said frame;

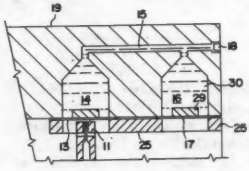
said frame having closed position with said pulling frame member being substantially aligned with said sliding frame member, said pulling frame member and sliding frame member extending substantially along said upper frame member and said first connection being at an inner end of said sliding hole spaced away from the second end of said pulling frame member.

4,984,600

SELF CORRECTING NOZZLE USEFUL WITH CURRENT TO PRESSURE TRANSDUCER

Robert I. Potter, San Jose, Calif., assignor to Alum Rock Technology, San Jose, Calif.

Filed Sep. 29, 1989, Ser. No. 414,395
The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.
Int. Cl.[5] G05D *16/00*
U.S. Cl. 137—82 **7 Claims**



1. A current-to-pressure transducer comprising:

a baseplate or housing made of magnetic material:

at least one chamber formed in said baseplate, said chamber having at least one open end;

at least one flexible membrane or diaphragm for sealing said open end;

a volume of magnetic fluid contained within said chamber;

air supply means disposed closely adjacent to said flexible membrane or diaphragm for supplying air;

an integral nozzle and pole piece structure comprising:

a longitudinal rod made of magnetic material;

a nozzle tube formed in a central portion of said rod for allowing the passage of air received from said air supply means;

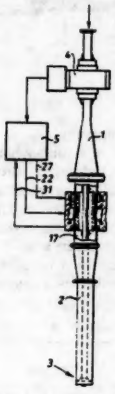
one end of said rod forming a magnetic pole piece, an end of said pole piece and an end of said nozzle tube being in a plane substantially coplanar with said one end of said rod.

4,984,601

UNIT APT TO ACT UPON THE FLOW

Sven-Arne Andersson, Veberöd, and Anders Sundberg, Malmö, both of Sweden, assignors to AB Profor, Lund, Sweden

Filed Sep. 8, 1989, Ser. No. 404,571
Claims priority, application Sweden, Sep. 22, 1988, 8803352
Int. Cl.[5] F16K *31/04*; G05D *7/06*
U.S. Cl. 137—486 10 Claims



1. A flow valve comprising:

a housing defining a flow path between a feed line portion and a filling pipe portion;

a shaft means disposed within said housing, said shaft means having an axis extending in a longitudinal direction of said flow path;

a valve body fixed to an end portion of said shaft means and positioned at said filling pipe portion of said housing, said valve body having at least one aperture that is selectively positionable into and out of alignment with at least one corresponding outlet hole of said filling pipe portion according to rotational movement of said shaft means; and,

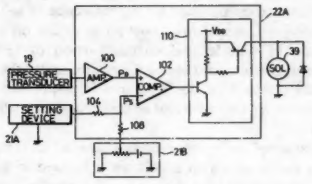
driving means for directing the flow situated between said feed line portion and said filling pipe portion of said housing, said driving means including an actuator and a stator wherein said actuator is situated within a chamber of said flow path and is attached to said shaft and said stator is situated substantially outside of said flow path in a position surrounding said actuator, said actuator being mechanically separated from said stator and said stator being substantially sealed from said flow path, said actuator being rotatable around said longitudinal axis by electromagnetic forces applied to said actuator by said stator to selectively position said at least one aperture of said valve body into and out of alignment with said at least one corresponding outlet hole of said filling pipe portion so as to selectively open and close said valve, said driving means further including at least one set of windings connectable to a source of current for generating electromagnetic forces for driving said actuator.

4,984,602

PRESSURE CONTROL APPARATUS AND APPARATUS FOR EFFECTING EXTRACTION CHROMATOGRAPHIC SEPARATION, AND FRACTIONATION BY EMPLOYING THE SAME

Muneo Saito, Hachioji; Yoshio Yamauchi, Hino; Hiromi Kashiwazaki, Hachioji; Michiaki Sugawara, Hachioji, and Toshinobu Hondo, Hachioji, all of Japan, assignors to Nihon Bunko Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 143,928, Jan. 14, 1988, abandoned. This application Dec. 22, 1989, Ser. No. 455,804
Claims priority, application Japan, Jan. 17, 1987, 62-008652; Aug. 13, 1987, 62-202380
Int. Cl.[5] G05D *16/20*
U.S. Cl. 137—487.5 8 Claims



1. A back-pressure control apparatus in an apparatus for extracting a soluble substance or separating said soluble substance into its components comprising

an electrically operable valve having small dead volume and operable between providing a fully open flow passage and a fully closed flow passage;

said valve located downstream of the extraction or separating apparatus;

a fluid passing through said valve being in either a supercritical state or liquefied gas state;

a pressure transducer for detecting a pressure P_D at a position upstream of said valve;

means for setting a predetermined pressure P_S having a valve greater than the critical pressure of said fluid;

and means for controlling operation of said valve between said open flow passage and said closed flow passage by controlling the opening and closing cyclically at a changing frequency in response to detection of said pressure P_D so as to limit change of said pressure P_D towards said pressure P_S.

4,984,603

FLOW CONTROL VALVE ASSEMBLY

Tadao Karakama; Naoki Ishizaki; Toshiro Takano, and Sadao Nunotani, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP89/00203, § 371 Date Oct. 17, 1989, § 102(e) Date Oct. 17, 1989, PCT Pub. No. WO89/08291, PCT Pub. Date Sep. 8, 1989
PCT Filed Feb. 28, 1989, Ser. No. 425,162
Claims priority, application Japan, Feb. 29, 1988, 63-44101
Int. Cl.[5] G05D *7/01*
U.S. Cl. 137—489 4 Claims

1. A flow control valve assembly comprising:

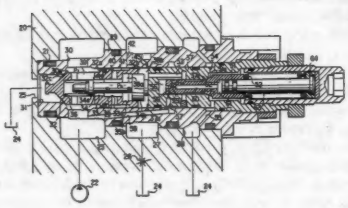
(a) a valve housing provided with: an inlet port communicating with a hydraulic pump to serve as an entrance of hydraulic operating fluid discharged from said hydraulic pump into said valve housing; a first, a second and a third outlet port sequentially formed in said valve housing from the outside of said valve housing to the inside thereof, each of which outlet ports communicates with a tank to serve as an exit of said hydraulic operating fluid from said valve housing, the inlet port in the valve housing being formed between said first and said second outlet ports;

(b) a hollow sleeve-like element which is received in a first valve receiving bore formed in said valve housing, pro-

vided with an incurrent port and an excurrent port which correspond to said inlet port and said outlet port, respectively;

(c) a poppet which is provided with a longitudinal length corresponding to a distance between said first outlet port and said second outlet port; and a large-diameter portion extending from a substantially intermediate portion of said poppet to a rear-end portion thereof, said poppet being received in a hollow portion of said hollow sleeve-like element so as to slidably move between a shutting-off position and a communication position, in which shutting-off position said poppet shuts off said incurrent port from said excurrent port, and in which communication position said poppet permits said incurrent port to communicate with said excurrent port, said poppet being urged into said communication position by the influence of said pressure oil confined in said inlet port so as to act on a shoulder portion of said large-diameter portion of said poppet, while urged into said shut-off position under the influence of said pressure oil confined in a back-pressure chamber formed in an area adjacent to said rear-end portion of said poppet;

(d) a first spool valve received in a stepped axial bore of said valve housing, which axial bore is formed in said poppet so as to be provided with a small-diameter bore portion and a large-diameter bore portion sequentially disposed from the outside of said valve housing to the inside thereof, said first spool valve being provided with a small-



diameter land portion and a large-diameter land portion which correspond to said small-diameter bore portion of said axial bore and said large-diameter bore portion of said axial bore, respectively;

(e) a first variable orifice formed between a slit-like communication port formed in a front-end side of said poppet and said small-diameter land portion of said first spool valve so as to be disposed in a position corresponding to that of said excurrent port of said sleeve-like element, an opening area of said first variable orifice being adjustable by slidably moving said poppet;

(f) a second variable orifice provided between said second outlet port and said tank;

(g) an axial element inserted into said sleeve-like element so as to be disposed in a position of a rear-end surface side of said poppet, a front-end portion of said axial element being disposed inside said valve housing so as to abut a rear-end surface of said first spool valve; and

(h) a second spool valve slidably inserted in a second valve receiving bore formed in said axial element, said second spool valve being urged into its shutting-off position by the influence of a resilient force of a spring so as to selectively shut off said back-pressure chamber of said poppet from said third outlet port and urged into its communication position by the influence of said pressure oil confined in a pressure chamber formed in said second valve receiving bore of said axial element for selectively receiving said pressure oil confined in said inlet port.

4,984,604

RUBBER HOSE

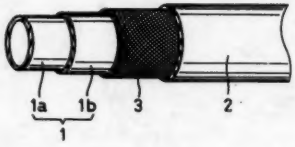
Kazuhiko Nishimura, Kasugai, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Jan. 16, 1990, Ser. No. 465,889

Claims priority, application Japan, Jan. 18, 1989, 1-9400

Int. Cl.[5] F16L *11/04*

U.S. Cl. 138—126 **12 Claims**



1. A rubber hose comprising:

an outer tube formed of a rubber material;

an inner tube located radially inwardly of said outer tube;

said inner tube including an inner layer formed of a first composition containing a fluoro rubber as a major constituent thereof, and an outer layer located radially outwardly of said inner layer; and

said outer layer of said inner tube being formed of a second composition containing as a major constituent thereof a blend of chlorosulphonated polyethylene and polyvinyl chloride.

4,984,605

CONDUCTING TUBE

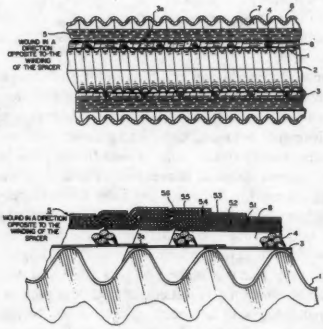
Klaus Schippl, Isernhagen, Fed. Rep. of Germany, assignor to Kabelmetal Electro, Hanover, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 299,256

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1988, 3803112

Int. Cl.[5] F16L *9/10*

U.S. Cl. 138—149 **15 Claims**



1. A conducting tube for the transport of intensely cold media, comprising:

an inner corrugated metal tube;

an outer corrugated metal tube arranged concentrically about said inner tube with an evacuated space therebetween;

a spacer applied helically to the inner corrugated metal tube;

a helically wound superinsulation layer disposed over the spacer and formed of alternately superposed layers of insulating material and reflecting material, the direction of

winding of the superinsulation layer being opposite to the direction of winding of the spacer whereby the superinsulation layer is held at a distance from the inner corrugated metal tube; and the corrugation grooves of the inner corrugated metal tube are covered by a foil, the foil is in direct contact with the inner corrugated metal tube, the spacer is in direct contact with the foil, and the superinsulation is in direct contact with said spacer.

4,984,606

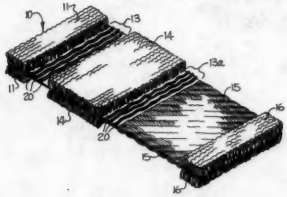
TERRY FABRICS WITH TUCKS AND METHOD OF MAKING

W. Gerald Moore, Eden, and Nancy W. Webster, Mebane, both of N.C., assignors to Fieldcrest Cannon, Inc., Greensboro, N.C.

Filed Sep. 11, 1989, Ser. No. 405,348

Int. Cl.[5] D03D *39/22, 27/08;* B32B *3/02;* D06C *23/04*

U.S. Cl. 139—25 **19 Claims**



1. A woven terry fabric comprising filling yarns, ground warp yarns, and terry warp yarns interwoven with each other throughout a major area of the fabric and forming ground fabric with said terry warp yarns extending therefrom in the form of terry pile and with the terry pile defining at least one face of the fabric, and other areas of the fabric having said terry warp yarns interwoven with filling yarns independently of said ground warp yarns and forming tucks extending widthwise of the fabric.

4,984,607

DEVICE FOR DRIVING HARNESSES OF WEAVING MACHINES

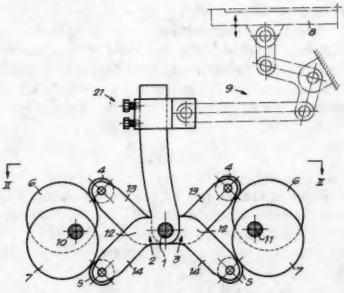
Daniel Beyaert, Wijtschate-Heuvelland, Belgium, assignor to Picanol N.V., Belgium

Filed Dec. 5, 1989, Ser. No. 446,143

Claims priority, application Belgium, Dec. 27, 1988, 8801436

Int. Cl.[5] D03C *13/00*

U.S. Cl. 139—79 **7 Claims**



1. A device for driving harnesses of weaving machines, comprising:

at least two cam shafts;

means for driving said cam shafts;

on each cam shaft, at least one pair of conjugated cams connected to each other;

a common shaft;

two levers;

means for swivel-mounting said two levers on said common shaft, symmetrically opposite to each other in respect to a plane including said common shaft;

means including two cam followers mounted on ends of each lever which contact respective conjugated cams for providing a positive cam drive of the levers so that they carry out an oscillating motion; and

transmission means for converting said oscillating motion of the levers into a linear motion of the harnesses.

4,984,608

TUCK-IN NEEDLE AND A PNEUMATIC SELVEDGE-FORMING DEVICE FOR A LOOM

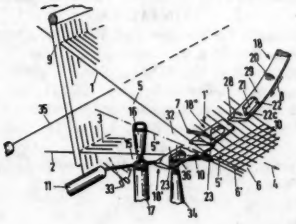
Gotthilf Bertsch, Ruti, and Josef Braum, Seuzach, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 14, 1989, Ser. No. 379,920

Claims priority, application Switzerland, Jul. 14, 1988, 02706/88

Int. Cl.[5] D03D *47/48*

U.S. Cl. 139—434 **18 Claims**



1. A tuck-in needle for a pneumatic selvedge-forming device for a loom, said needle having a strip-like end part movable into a shed of warp yarns, said end part having a cross-section with two wide sides, a first narrow side surface facing in a direction of an apex of said shed and a second narrow side surface facing in an opposite direction, said end part including an angled end face defining a tip directed in a direction away from said shed apex and an elongated yarn entry aperture extending longitudinally of said end part to receive a weft yarn end therein.

4,984,609

PLANETARY GRIPPER BAR DRIVE WITH ADJUSTABLE CRANK AND LEVER ARM LENGTHS

Heinz Maassen, and Günter Meyer, both of Viersen, Fed. Rep. of Germany, assignors to N.V. Michel Van de Wiele, Kortrijk-Marke, Belgium

Continuation of Ser. No. 125,327, Nov. 25, 1987, abandoned. This application Dec. 5, 1989, Ser. No. 445,932

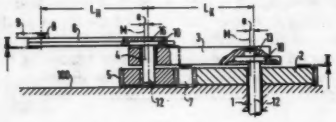
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640717

Int. Cl.[5] D03D *47/12*

U.S. Cl. 139—449 **18 Claims**

1. Gripper bar drive for weaving machines, with a drive configured according to the principle of an equal sided rectilinear thrust crank gear, comprising a crank arm attached to a drive shaft within an area of one end of the crank arm, a sun wheel placed coaxially to the drive shaft, and an articulated lever placed in an area of the other end of the crank arm, wherein in an area of one end of the articulated lever, the articulated lever is connected to a crank shaft pin which is mounted in an articulated manner on the crank arm within an

area of the other end of the crank arm, wherein in the area of the other end of the articulated lever, a pivot bolt is provided for a gripper bar, wherein the effective length (LK) of the crank arm formed by the distance between axes of the drive shaft and of the crank shaft pin, and the effective length (LH) of the lever (6) formed by the distance between axes of the crank shaft pin and the pivot bolt, are equal, wherein a planet



wheel is coaxially attached to the crank shaft pin, and the planet wheel is connected to the sun wheel with a transmission ratio of 1:2 and further having first and second adjustment means provided for displacing the crank arm (3) relative to the drive shaft and displacing the articulated lever (6) relative to the crank shaft pin (4) respectively, wherein the effective lengths (LK) and (LH) of the crank arm (3) and of the articulated lever (6) can be adjusted.

4,984,610

PROCESS FOR FILLING TRAVELING SILO CONTAINERS

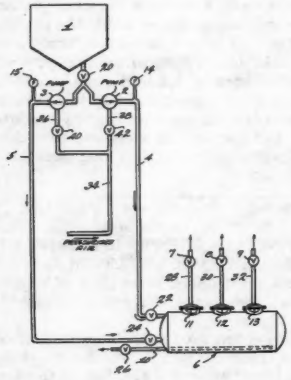
Wolfgang Eckert, Rheinfelden, Fed. Rep. of Germany, assignor to Degussa, Fed. Rep. of Germany

Continuation of Ser. No. 277,481, Nov. 15, 1988, abandoned, which is a continuation of Ser. No. 100,821, Sep. 25, 1987, abandoned, which is a continuation of Ser. No. 377,544, May 12, 1982, abandoned. This application Mar. 15, 1990, Ser. No. 494,959

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120356

Int. Cl.[5] B65B *1/04*

U.S. Cl. 141—5 **8 Claims**



1. A process of filling a substantially rigid traveling storage container having at least one dome cover with pyrogenically produced silica comprising:

fluidizing pyrogenically produced silica in a supply container;

providing a substantially rigid traveling storage container having at least one dome cover and at least one inlet disposed away from the at least one dome cover;

filling the substantially rigid traveling storage container by supplying the fluidized silica from said supply container to at least one inlet of the storage container disposed away from the at least one dome cover with the aid of at least one compressed air diaphragm pump, a main axis of the traveling storage container being one of horizontal and at an angle to the horizontal; and

allowing air to escape without suction through at least one opened valve connected to at least one said dome cover for said container while preventing the silica from escaping through the dome cover by means of a filter disposed in the dome cover, the pressure in the traveling storage container during the filling being a superatmospheric pressure up to 0.1 bar below the pressure limit of the container.

4,984,611

VACUUM STORAGE DEVICE

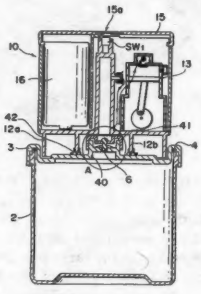
Toyohiko Takatsuki, Izumi; Atsushi Kirimoto, Nara, and Toshiyuki Nanbe, Takarazuka, all of Japan, assignors to Zojirushi Corporation, Osaka, Japan

Filed May 22, 1989, Ser. No. 355,017

Claims priority, application Japan, Apr. 5, 1989, 1-86300

Int. Cl.[5] B65D *51/16*

U.S. Cl. 141—65 **7 Claims**



1. A vacuum storage device, comprising: a closed vessel for storing food; and a pressure-reducing device removably mounted on said closed vessel to draw air therefrom,

said closed vessel comprising a vessel body and a lid removably attached to said vessel body and provided with an air exhaust port and a check valve arranged therein said check valve having an upper stem portion and a lower stem portion,

said pressure-reducing device being provided at its bottom with a suction port and with means for hermetically connecting its suction port to the air exhaust port of said closed vessel when said pressure-reducing device is mounted on said vessel,

said lid being provided with a valve housing having a cap removably attached thereto, said check valve being housed in said valve housing so that it is attached at its upper stem portion to the cap and guided at its lower stem portion in the air exhaust port of the lid.

4,984,612

AUTOMATIC SHUT-OFF LIQUID DELIVERY NOZZLE

Cornelis F. de la Haye, The Hague, Netherlands, assignor to Koppens Automatic Fabrieken B.V., Bladel, Netherlands

Filed Apr. 13, 1989, Ser. No. 337,714

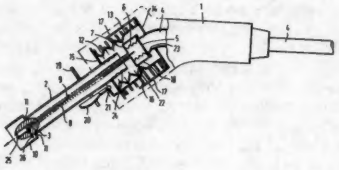
Claims priority, application Netherlands, Apr. 13, 1988, 8800959

Int. Cl.[5] B65B *3/04*

U.S. Cl. 141—198 **6 Claims**

1. A nozzle, a fuel supply hose having an outlet end connected to said nozzle, said nozzle including an outlet pipe having a free discharge end and an inlet end, a valve, means for

operating said valve, means responsive to sub-atmospheric pressure for automatically closing said valve, said valve being disposed at the free discharge end of said outlet pipe, said inlet



end of said outlet pipe being connected to the supply hose by means of a first bellows shiftable between extended and collapsed positions, releasable means on the outside of said outlet pipe for maintaining said first bellows in said extended position.

4,984,613

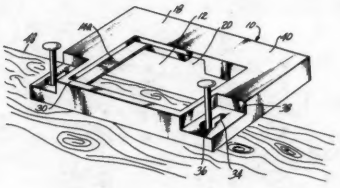
HINGE MORTISE GUIDE AND CUTTER

Danny Szeto, and Lin K. Szeto, both of 3165 E. Green St., Pasadena, Calif. 91107

Filed Dec. 29, 1989, Ser. No. 458,945

Int. Cl.[5] B27F *5/12*; B27M *3/00*

U.S. Cl. 144—27 **13 Claims**



1. A mortise guide and cutter for mortising a workpiece comprising:

a frame having a rectangular aperture;

means for positioning the frame comprising means for engaging an edge of the workpiece;

means for attaching the frame to the workpiece;

a sizing blade pivotally mounted to the frame the blade having a first position exposing the entire aperture and a second position reducing one dimension of the aperture by the width of the blade, the blade rotatable from the first position to the second position; and

means for cutting a mortise.

4,984,614

COMBINED SAW AND CHIPPER HEAD

Adrian L. Landers, and Richard D. Landers, both of Pocatello, Id., assignors to Hi-Tech Engineering and Machine Company, Inc., Pocatello, Id.

Filed Mar. 8, 1990, Ser. No. 490,361

Int. Cl.[5] B27C *9/00*

U.S. Cl. 144—220 **16 Claims**

1. A combination saw and chipper head comprising:

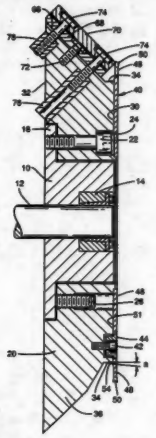
a generally truncated conical body, having a central axis of rotation and having a substantially planar face at its smaller end perpendicular to said axis;

means for mounting said body on a shaft for rotation of said body in a predetermined direction about said axis,

a circular saw blade mounted to said face concentrically thereof said saw blade having a plurality of alternating teeth and gullets formed on the periphery thereof, said teeth projecting beyond the periphery of said face;

a plurality of chipper knives mounted on said body;

each of said chipper knives having a substantially straight



cutting edge terminating in a rectangular corner which lies immediately behind a said saw tooth but at a lesser distance from said axis than the cutting edge of said tooth, the knife cutting edges extending from said corner angularly outwardly with respect to said axis.

4,984,615

METHOD AND DEVICE FOR CUTTING A SANDWICH PANEL

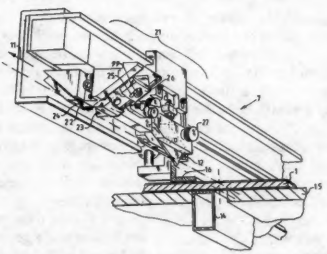
Roelof Terwel, Ommen, Netherlands, assignor to 501 Sallmetall BV, Raalte, Netherlands

Filed Aug. 1, 1989, Ser. No. 388,603

Claims priority, application Netherlands, Aug. 3, 1988, 8801939

Int. Cl.[5] B27M *1/08, 1/00*

U.S. Cl. 144—367 **16 Claims**



9. A device for making a cut in a sandwich panel having a core and first and second skin plates adhered thereto, comprising:

means for forming a channel extending along a path for making a cut, by removing the first skin plate along the path for making a cut;

first cutting means having a blade sufficiently long to cut the sandwich panel to a desired depth;

means for positioning the blade of the first cutting means in the channel; and

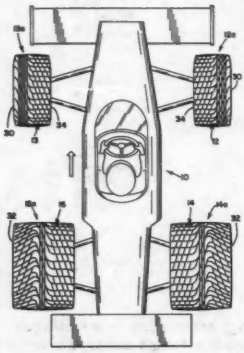
means for setting the blade of the first cutting means in motion in the direction of the channel to make the cut.

4,984,616

FRONT AND REAR TIRE TREAD PATTERNS IN A FOUR-WHEELED TIRE/VEHICLE SYSTEM

Peter R. Shepler, Stow; Nathan A. Gammon, Akron; William M. Hopkins, Hudson; James E. Koerner, Uniontown, and Charles K. Schmaltz, Canal Fulton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 25, 1989, Ser. No. 357,507
Int. Cl.[5] B60C *11/03*
U.S. Cl. 152—209 A 3 Claims



1. An improved tire/vehicle system designed for year-round or high speed use as an automotive passenger vehicle on paved road surfaces, the vehicle having two pneumatic front tires mounted thereon and two pneumatic rear tires mounted thereon, each said tire having a tread with grooves therein, at least a portion of the tread of each rear tire tracking one of the front tires, the net-to-gross ratio of each tread of each rear tire being at least 2% less than that of the tread of the front tire that it tracks;

each said front tire tread comprising first and second circumferentially extending zones, the zones having edges which are parallel to the equatorial plane of the front tire, each zone having a width of between 40% of 60% of the width of the front tire tread, said first zone having a net-to-gross ratio between 60% and 70% and a width between 7 and 17 centimeters with substantially aligned lateral wide groove segments extending thereacross, and along a majority of its length in the first zone each lateral wide groove forms an angle between 70° and 90° with respect to a plane parallel to the equatorial plane of the front tire; the second zone having a net-to-gross ratio between 54% and 64% and a width between 7 and 17 centimeters with substantially aligned lateral wide groove segments extending thereacross, along the majority of its length in the second zone each lateral width groove has a centerline which forms an angle between 10° and 45° with respect to a line parallel to the equatorial plane, the net-to-gross ratio of the second zone being at least 5% less than the net-to-gross ratio of the first zone, the lateral wide grooves of the second zone merging into the lateral wide grooves of the first zone, wide grooves in the tread intersect the lateral wide grooves to form blocks, which each have a leading and trailing edge, the trailing edges of the blocks in the first zone being wider than the leading edges of the same blocks;

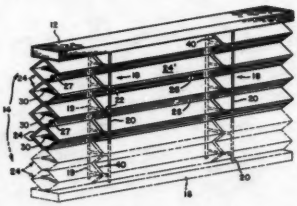
each rear tire tread comprising third, fourth and fifth circumferentially extending zones, said zones having edges which are parallel to the equatorial plane of the rear tire, the fourth zone being disposed between the third zone and the fifth zone, the axial width of said third zone being between 25% and 50% of the axial width of said rear tire tread and having a net-to-gross ratio between 62% and 72%, lateral wide groove segments extending thereacross and having centerlines forming angles between 70 degrees and 90 degrees with respect to the equatorial plane of the rear tire, the width of the fourth zone being between 15% and 35% of the width of said tread, and having a net-to-gross ratio between 45% and 55% with wide groove segments therein which extend generally perpendicular to wide groove segments extending across the fifth zone, the width of the fifth zone being between 25% and 50% of the width of said rear tread and having a net-to-gross ratio between 56% and 66% with the lateral wide groove segments extending thereacross forming an angle between 45 degrees and 70 degrees with a plane parallel to the equatorial plane of the rear tire, the net-to-gross ratio of each zone in each said rear tire tread being at least 4% different from the other zones of the same tread and each said rear tire having wide groove segments which intersect said lateral wide groove segments to form blocks having leading and trailing edges, the leading edges of the blocks in the third zone being wider than the trailing edges of the blocks of the third zone.

4,984,617

ENVELOPED BLIND ASSEMBLY USING INDEPENDENTLY ACTUATED SLATS WITHIN A CELLULAR STRUCTURE

John A. Corey, Melrose, N.Y., assignor to Comfortex Corporation, Cohoes, N.Y.

Filed Nov. 2, 1989, Ser. No. 431,297
Int. Cl.[5] A47H *5/00*
U.S. Cl. 160—84.1 12 Claims



1. A flexible and collapsible-expansible, pleated multicellular shade array having spaced-apart, pleated obverse and reverse faces and pleat trough joining means to connect opposing troughs of said faces to form individual sleeve-like cells in said shade and further, including within individual cells that lie in a singular plane within said shade, a pivotally movable Venetian blind slat.

4,984,618

Patent Not Issued For This Number

4,984,619

FREE STANDING BABY GATE

Larry R. Ellis, 1098 Highland Dr., St. Albans, W. Va. 25177

Filed Jul. 19, 1989, Ser. No. 381,792
Int. Cl.[5] A47G *5/00*
U.S. Cl. 160—351 1 Claim

1. A free-standing gate and gate frame adapted to fit at the top of a stairway, comprising:

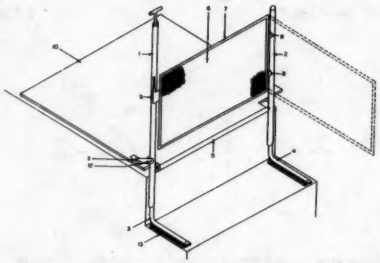
(a) a gateframe consisting of two vertically oriented posts, adapted to rest on respective lower ends thereon a top stair and, which are supported by horizontal feet located on said lower end which rest on the top stair, a horizontal beam extending between said posts at a location above said feet a distance substantially equal to the distance between the top stair and the floor at the top of the stair-

way with the major portion of said posts extending above said horizontal beam.

(b) a rigid generally planar mat which is a adapted to the floor at the top of the stairway and is hinged to said beam running between the two posts,

(c) a movable gate which is hinged to one of the posts, and which latches to the other post,

(d) braces which attach pivotally to the posts and are adapted to rotate toward and lock against the rigid mat,



(e) means pivotally connecting the braces to the posts,

(f) means locking the braces against the mat,

(g) means hinging said mat to gateframe,

(h) means hinging said movable gate to a post of said gateframe, and

(i) means latching said movable barrier gate to the other post of said gateframe.

4,984,620

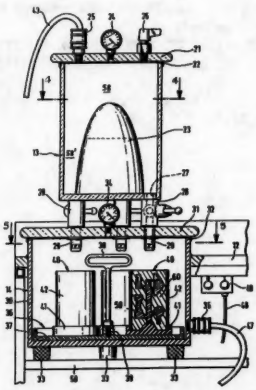
APPARATUS FOR MAKING MOLDS FOR MAKING METAL CASTINGS

Christina Assfalg, Mathystrasse 36, 7530 Pforzheim, Fed. Rep. of Germany

Filed May 23, 1989, Ser. No. 355,678

Int. Cl.[5] B22C *5/02*

U.S. Cl. 164—160.1 **12 Claims**



4. In a molding apparatus for making molds for making metal castings from a liquid to pasty composition which comprises an aqueous continuous phase, a binder and, in addition, at least one solid mineral component, said apparatus comprising

an upper container and a lower container, which are concentrically arranged one over the other, and each of which comprises a bottom, a cylindrical shell rising from the bottom and having a top rim, and a cover mounted on said top rim and adapted to vacuumtightly seal said container, said shell of said upper container having a vertical portion adjacent to said bottom of said upper container,

a vacuum pump,

evacuating line means connecting said upper and lower containers to said vacuum pump,

shut-off valve means for shutting off said evacuating line means,

flow guiding means providing a flow guiding surface disposed in said upper container adjacent to said bottom thereof and defining with said shell of said upper container a distributing space,

a plurality of cups, which are arranged in said lower container in a circular array,

a plurality of pipe lengths, which are equal in number to said cups and arranged in a circular array and connect the interior of said upper container to the interior of said lower container and have respective inlets which are open to said distributing space to receive said composition therefrom and respective outlets, which are disposed in said lower container over respective ones of said cups to deliver said composition thereto, and

a plurality of shut-off valves for shutting off respective ones of said pipe lengths,

the improvement residing in that

said flow guiding means comprise an approximately rotationally symmetrical guiding body, which is concentrically arranged in said upper container and has a closed peripheral surface which constitutes said flow guiding surface,

said distributing space extends from said cover of said upper container as far as to said inlets of said pipe lengths, and

said vertical portion of said shell of said upper container defines with said flow guiding surface in said distributing space an annular mouth space, which adjoins said inlets,

wherein said flow guiding body has the shape of a cone which has a rounded apex and a base surface which rests on the bottom of the upper container.

4,984,621

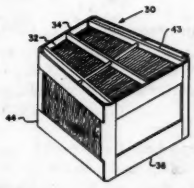
ELEMENT BASKET ASSEMBLY FOR HEAT EXCHANGER

Norman P. Miller, and Leo W. Eaton, both of Wellsville, N.Y., assignors to ABB Air Preheater, Inc., Wellsville, N.Y.

Filed Jul. 16, 1990, Ser. No. 553,032

Int. Cl.[5] F28D *19/04*

U.S. Cl. 165—10 **4 Claims**



1. An element basket assembly for use in a rotary regenerative heat exchanger comprising a plurality of heat transfer element plates juxtaposed in a stacked array so as to form a plurality of flow passages therethrough, and a basket frame surrounding the stacked array of heat transfer element plates in supporting relationship therewith, said basket frame comprising:

a. first and second shell members disposed in spaced parallel relationship, said first shell member disposed along the upper portion of the stacked array of heat transfer element plates and said second shell member disposed along the

lower portion of the stacked array of heat transfer element plates, each of said first and second shell members comprising an elongated plank-like member formed into a trough-like member having a base end portion and a pair of spaced legs extending outwardly from the base and portion thereof;

b. means for interconnecting the base end portion of the first shell member to the base end portion of the second shell member;

c. an end closure member mounted between the outboard ends of the spaced legs of the first and second shell members to form a frame about the stacked array of heat transfer element plates; and

d. means abutting the upper and lower surfaces of the stacked array of heat transfer element plates and connected to the frame for retaining the heat transfer plates within the frame.

4,984,622

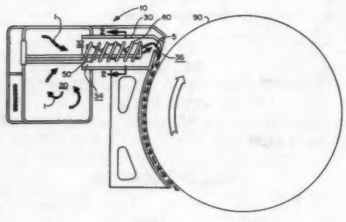
APPARATUS FOR SUPPLYING TEMPERATURE REGULATED AIR TO A CALENDER ROLL

Gordon K. Reed, Bexley, Ohio, assignor to Process Automation Business, Inc., Columbus, Ohio

Filed Oct. 2, 1989, Ser. No. 415,947

Int. Cl.[5] F24H *3/04*; B30B *15/34, 15/04*

U.S. Cl. 165—47 **6 Claims**



4. Apparatus for heating or cooling fluid comprising:

a. a plenum chamber for receiving the gaseous fluid;

b. longitudinally extending conduit means having an inlet at one end thereof opening to said plenum chamber and an outlet at the other end thereof and defining therebetween a flow passageway;

c. helical wound heat transfer coil means for selectively heating or cooling, said heat transfer coil means disposed longitudinally within the flow passageway of said conduit means and having a flow path through the center thereof and wound in a first direction; and

d. a flow turbulator disposed within the center of said heat transfer coil means in the flow path therethrough whereby the gaseous fluid passing through the flow therethrough is directed into contact with said heat transfer coil means, said flow turbulator comprising a thin spiral-twisted ribbon-like strip having a width less than the inner diameter of said heat transfer coil means and twisted in a second direction counter to the first direction in which said heating coil is wound.

4,984,623

ELECTRODE WATER CIRCULATION AND PROCESSING SYSTEM AND HOODED RADIATOR FOR WATER RHEOSTAT

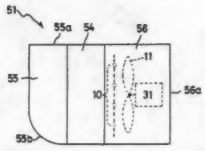
Kesafumi Matsumoto, Atsugi, Japan, assignor to Kouken Co., Ltd., Kanagawa, Japan

Division of Ser. No. 369,486, Jun. 21, 1989, Pat. No. 4,939,500. This application Dec. 12, 1989, Ser. No. 449,672

Claims priority, application Japan, Jul. 11, 1988, 63-171021; Aug. 22, 1988, 63-206454

Int. Cl.[5] F28C *3/08*

U.S. Cl. 165—104.33 **3 Claims**



1. A hooded radiator comprising a spray nozzle means and a motor coupled with a fan located behind said spray nozzle means, said spray nozzle means and motor coupled fan being provided at the face of the rear of the body of said radiator, said radiator being provided in an electrode water cooling and circulation passage line, and a hood covering the front of said body and having a steam release port in the top of said hood, each of both sides of said hood being shaped as an inverted right-angled triangle and being pivotally coupled at the bottom of said sides to the bottom of both side edges of the front of the body of said radiator so that said hood can be freely swung, both of said sides of said hood being slidably overlaid on both sides of said body.

4,984,624

METHOD FOR THE START-UP AND SHUT-DOWN OF AN INSTALLATION FOR OPERATING PHYSICAL AND/OR CHEMICAL PROCESSES, AND A SYSTEM FOR THIS PURPOSE

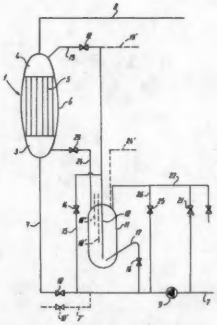
Dick G. Klaren, Hillegom, Netherlands, assignor to Eskla B.V., Schiedam, Netherlands

Filed Oct. 13, 1989, Ser. No. 421,177

Claims priority, application Netherlands, Oct. 18, 1988, 8802570

Int. Cl.[5] F28D *3/12*

U.S. Cl. 165—104.16 **15 Claims**



1. Method for the start-up and shut-down respectively of an installation for operating physical and/or chemical processes,

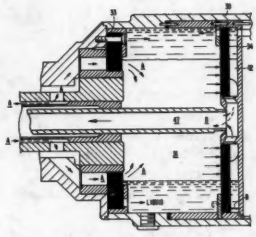
for example a heat exchanger, which installation comprises a bundle of parallel vertical tubes which, via tube plates, are in open connection with a bottom header and a top header, in which a granular mass can be maintained in a steady or quasi-steady fluidised state, at least in the tubes, by means of a medium flowing upwards through the headers and the tubes during operation, characterized in that first of all a partial stream of the medium is fed via the bottom header, the tubes and the top header while there is still no granular mass present herein and that subsequently granular mass is flushed from a storage vessel into the installation, until said mass has been transferred from the storage vessel, after which the main stream of the medium is fed through the bottom header, tubes and top header; or, for shut-down respectively, that first the main stream of the medium is reduced to a partial stream, after which the granular mass is flushed back from the bottom header to the storage vessel, after which the remaining partial stream of the medium is shut off.

4,984,625

DEMISTING SCREEN ARRANGEMENT FOR TWO-PHASE THERMAL MANAGEMENT SYSTEM

Gerhardt E. Lichtfuss, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 8, 1988, Ser. No. 268,884
Int. Cl.[5] F28D *15/02*
U.S. Cl. 165—104.25 **14 Claims**



8. A two-phase thermal management system, comprising at least one evaporator, condenser means and a rotary fluid management device for managing two-phase flow in the system, wherein the rotary fluid management system comprises a rotating drum, means for providing a liquid-phase/vapor-phase fluid mixture to an inlet section of the rotating drum, first demisting screen means mounted at the inlet section of the rotating drum to rotate with the drum for removing and centrifugally separating liquid-phase fluid from the mixture as the mixture enters the rotating drum, second demisting screen means mounted at another section of the rotating drum to rotate with the drum for removing remaining liquid phase fluid from the mixture; and means for decreasing the velocity of the mixture as it passes through the second demisting screen so as to cause the mixture to contact a greater volume of the second demisting screen between an inlet side and an outlet side of the second demisting screen.

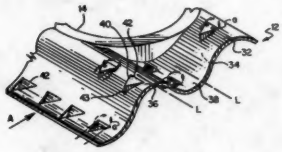
4,984,626

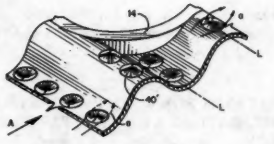
EMBOSSED VORTEX GENERATOR ENHANCED PLATE FIN

Jack L. Esformes, and Lawrence W. Ubowski, both of Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 24, 1989, Ser. No. 441,026
Int. Cl.[5] F28D *1/04*; F28F *1/26*
U.S. Cl. 165—151 **5 Claims**

1. In an enhanced plate fin of a plate fin heat exchanger having a plurality of enhanced plate fins each having a convoluted heat transfer means for enhancing the exchange of heat between a fluid flowing over a surface of the fin, the convoluted heat transfer means having a sine-like wave pattern of predetermined height along the fin in a direction parallel to the flow of fluid over the fin, the sine-like wave pattern having curved peaks at a maximum and minimum of the wave heights of the pattern along the fin, the peaks extend along the convoluted heat transfer means generally transverse to the direction of flow of the fluid flowing over the fin, the improvement comprising an enhanced heat transfer section, said enhanced heat transfer section having a plurality of spaced apart rows of enhancement means arranged in a direction generally perpendicular to the direction of flow of the fluid over the fin, each spaced apart row of enhancement means comprising a series of generally identical embossed vortex generator means, each spaced apart row of enhancement means being located downstream in the fluid direction of the maximum and minimum of the curved peaks in the range between 0 and $\frac{1}{4}\lambda$, where one complete length of the sine-wave like pattern is equal to one λ, said embossed vortex generator means forming a continuous fin surface on said enhanced heat transfer section free from apertures therethrough wherein each embossed vortex generator means generates a pair of counter rotating vortices.





4,984,627

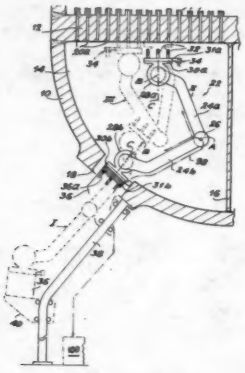
INTERVENTION DEVICE, PARTICULARLY FOR CHECKING, INSPECTING AND MAINTAINING HEAT EXCHANGERS

Luc LeBourgeois, Versailles, France, assignor to Intercontrole Societe Anonyme, Rungis Cedex, France

Filed Feb. 23, 1990, Ser. No. 484,058
Claims priority, application France, Mar. 16, 1989, 89 03468
Int. Cl.[5] B25J *9/06*
U.S. Cl. 165—11.2 **8 Claims**

1. Intervention device which can be fastened into the perforations of a tube plate of a heat exchanger and can move on said plate, wherein it comprises an articulated connecting arm formed by at least two rigid segments interconnected by an articulation defining a first axis, two handles mounted at each of the ends of the connecting arm and each defining two degrees of rotation freedom about second and third axes orthogonal to one another, two plates respectively supported by each

of the handles and each having means for supporting at least one intervention tool and fastening means which can engage in



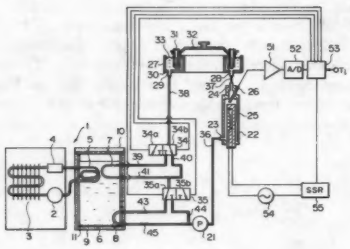
perforations of the tube plate and motorization means able to control the pivoting about the first, second and third axes.

4,984,628

APPARATUS FOR MAINTAINING LIQUID TEMPERATURE AT A CONSTANT LEVEL

Hiroyasu Uchida; Tetsuaki Abe, and Hiroaki Ishizawa, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 6, 1989, Ser. No. 375,884
Claims priority, application Japan, Jul. 9, 1988, 63-171652
Int. Cl.[5] F25B *29/00*
U.S. Cl. 165—26 **2 Claims**



1. An apparatus for maintaining liquid temperature at a constant level, comprising:

a reaction vessel for containing liquid, and having an outlet port,

cooling means, including a cooling water tank, for cooling said liquid,

heating means for heating the liquid cooled by said cooling means,

temperature detecting means for detecting a temperature of the liquid heated by said heating means,

heat exchange rate control means for controlling the heat exchange rate between said cooling means and said liquid, including a plurality of cooling tubes extending into said cooling water tank of said cooling means for passing said liquid, each of said tubes having a different heat exchange capacity, and switching valve means for switching liquid passages communicating with said plurality of cooling tubes,

circulating means for circulating the liquid among said reaction vessel, said heat exchange rate control means and said heating means, and

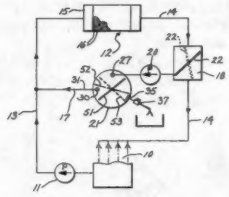
control means for controlling said heating means and said heat exchange rate control means based on a temperature difference between said detected temperature and a desired temperature.

4,984,629

BALL COLLECTOR AND FILLING APPARATUS FOR CIRCULATING BALL CLEANING SYSTEM

Donald J. Voith, Milwaukee; David G. Paegelow, West Bend, and John E. Jagodzinski, Milwaukee, all of Wis., assignors to Water Services of America, Inc., Milwaukee, Wis.

Filed Sep. 13, 1989, Ser. No. 406,800
Int. Cl.[5] F28G *1/12*; B08B *9/04*
U.S. Cl. 165—95 **21 Claims**



1. In a pipe cleaning system wherein porous resilient foam rubber balls are circulated in a flow of water through the pipes to be cleaned, an apparatus for selectively recirculating the balls, collecting and holding the balls, and discharging the balls from the system, said apparatus comprising:

a housing having a cylindrical outer wall and opposite end walls;

a ball-retaining screen pivotally mounted within the housing for rotation on the axis of said cylindrical outer wall;

a flow inlet, a flow outlet, and a ball outlet in the housing;

said screen being selectively rotatable between:

a ball recirculating position with the flow inlet and flow outlet disposed on a ball-retaining side of the screen;

a ball collecting and holding position with the flow inlet disposed on the ball-retaining side of the screen; and,

a ball discharging position with the ball outlet disposed on the ball retaining side of the screen; and,

means for controlling the flow through the housing and for controlling the discharge through said ball outlet.

4,984,630

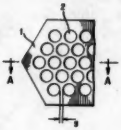
TUBE SHEET FOR APPARATUS FOR TRANSFERRING HEAT AND/OR MASS, USE THEREOF AND PROCESS FOR ITS PRODUCTION

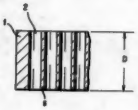
Hermann Gemeinhardt, Obernburg; Elmar Hoff, Bochum, and Erich Schürmann, Sendenhorst, all of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Mar. 1, 1989, Ser. No. 317,522
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1988, 3806517
Int. Cl.[5] F28F *9/02*
U.S. Cl. 165—173 **8 Claims**

1. Injection-molded, substantially planar tube sheet of thermoplastic material for an apparatus for transferring at least one of heat and mass, said planar tube sheet containing at least 25 unoccupied through-holes for subsequently receiving tube

ends, with at least 3 of said through-holes being arranged in a non-linear relationship, wherein the holes have a hydraulic





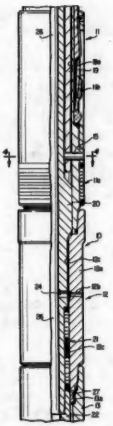
diameter of at most 3 mm and a minimum web width between neighboring holes of at most 0.4 mm.

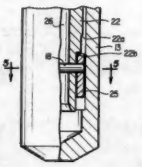
4,984,631

SYSTEM AND PLUG FOR PLUGGING A CONDUIT

David L. Reesing, Irving, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 19, 1989, Ser. No. 367,931
Int. Cl.[5] E21B *23/02, 34/14*
U.S. Cl. 166—115 **15 Claims**





1. A plug for controlling flow through a lock mandrel comprising:

(a) a valve housing connectable to said lock mandrel and having flow ports therethrough;

(b) a cap connected on said valve housing;

(c) prong means in said valve housing, said prong means including an upper section having flow ports therethrough and seals thereon below said ports, said prong means longitudinally moveable from an open position permitting flow through said housing ports to a locked closed position preventing flow through said housing ports;

(d) means for locking said prong means in closed position including a retainer connected to said prong upper section below said seals, upper and lower shoulders on said retainer, and a c-ring around said retainer engageable with the lower end of said valve housing; and

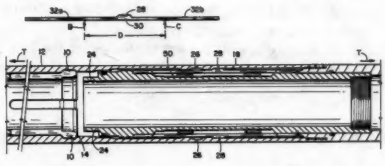
(e) means for releasably retaining said prong means in said valve housing.

4,984,632

HYDRAULIC RELEASE JOINT FOR TUBING SYSTEMS

Augdon Sampa, Stafford, and Bart Thomeer, Houston, both of Tex., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Mar. 27, 1989, Ser. No. 328,667
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—237 **3 Claims**



1. A tubing coupling comprising:

(a) a first tubular body having an outer surface and a radially outwardly extending collet, and

(b) a second tubular body having an inner bore and an outer surface and further including:

(1) annular grove means for receiving said collet of said first tubular body;

(2) an axially movable piston having an outer surface and including a collet retainer, said piston located within said inner bore of said second tubular body;

(3) a detent retaining groove located on one of said outer surface of said piston and said inner bore of said second tubular body adjacent said piston, and

(4) a cantilever spring having a detent which is retained within said detent retaining groove, said cantilever spring having leg portions and spring adjusters located between said leg portions of said cantilever spring and the other of said outer surface of said piston and said inner bore of said second tubular body,

whereby differential pressure between internal pressure within said first and second tubular bodies and pressure acting on said outer surfaces of said first and second tubular bodies causes said piston to move axially against a force of said cantilever spring thereby releasing its detent from said detent retaining groove permitting release of said collet retainer from said collet so that an axial tension force can separate said first and second tubular bodies.

4,984,633

NOZZLE EFFECT PROTECTORS, CENTRALIZERS, AND STABILIZERS AND RELATED METHODS

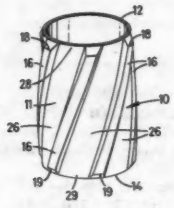
Friedrich H. Langer, and Michael J. Woodward, both of Houston, Tex., assignors to Weatherford U.S., Inc., Houston, Tex.

Filed Oct. 20, 1989, Ser. No. 424,092
Int. Cl.[5] E21B *17/10, 17/16*
U.S. Cl. 166—241 **13 Claims**

1. Centralizer apparatus for use in well operations with a string of tubular members, the apparatus comprising

a generally cylindrical hollow body having an inner surface and an outer surface and a top and a bottom and disposable on the outside of a tubular member of the string of tubular members,

a plurality of ribs protruding from and spaced apart on the body, each rib extending along the body, for enhancing the turbulence of a flow of a fluid or material past the apparatus's outer surface,



a distance at the top of the apparatus between consecutive ribs differing from a distance at the bottom of the apparatus between said consecutive ribs, and

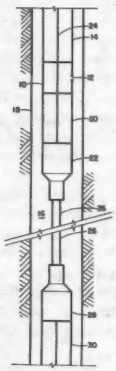
the body having a wall thickness thicker at the top than at the bottom to enhance the flow of the material past the apparatus.

4,984,634

LOGGING OF SUBTERRANEAN WELLS USING COILED TUBING

Jacques Pilla, St. Remy Les Chevreuse, France, assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Feb. 26, 1990, Ser. No. 485,187
Int. Cl.[5] E21B *43/00, 47/00*
U.S. Cl. 166—250 **5 Claims**



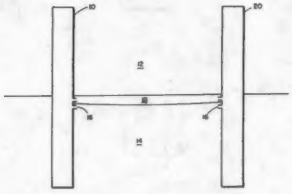
1. An apparatus for production logging of a well utilizing artificial lift in a wellbore comprising coiled tubing extending into the wellbore having wireline electrical cable passing through a central bore thereof and having a remote end within the wellbore which end is connected to gas injector means, said wireline cable passing through said gas injector means to a flexible electrically conductive support spacer having an end portion remote from said gas injector means and logging means connected to said end portion of said support spacer.

4,984,635

THERMAL BARRIERS FOR ENHANCED OIL RECOVERY

Alvin S. Cullick, and Randy D. Hazlett, both of Dallas, Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 16, 1989, Ser. No. 437,418
Int. Cl.[5] E21B *33/138, 43/24, 43/243*
U.S. Cl. 166—261 **15 Claims**



1. A method for reducing thermal conductivity and heat loss between zones of a formation or reservoir comprising:

(a) placing a foamable mixture into at least one zone of a formation adjacent to a second zone that can undergo thermal stimulation which mixture is sufficient to form a rigid foam layer which mixture comprises

(i) a thermosetting foamable resin or prepolymer, and

(ii) a means for foaming said resin;

(b) allowing said mixture to remain in said zone for a time sufficient for said mixture to react from a temperature rise in the second zone thereby forming a rigid layer sufficient to reduce thermal conductivity and heat loss from said second zone.

4,984,636

GEOTHERMAL WELLHEAD REPAIR UNIT

Thomas F. Bailey, and James N. Strickland, both of Houston, Tex., assignors to Drilex Systems, Inc., Houston, Tex.

Filed Feb. 21, 1989, Ser. No. 313,688
Int. Cl.[5] E21B *33/129*
U.S. Cl. 166—277 **17 Claims**

1. A well packer settable and retrievable within a well bore using a running tool to selectively isolate the wellhead, said packer comprising:

an inner mandrel;

a sleeve assembly releasably attached to said inner mandrel by first latching means, said sleeve assembly selectively detachable from said mandrel for longitudinal movement of said mandrel in a first direction relative to said sleeve assembly to set said packer;

a connector sub detachably connected to an upper end of said mandrel by second latching means, said connector sub attached to the running tool;

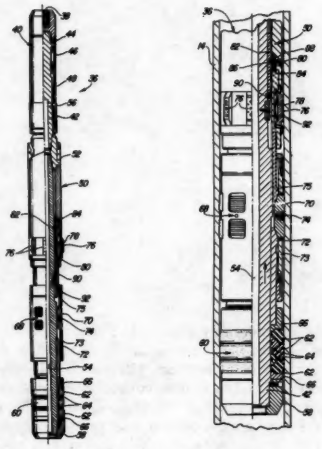
locking ratchet means to selectively prevent longitudinal movement of said mandrel in a second direction relative to said sleeve assembly to unset said packer, said ratchet means being selectively unlockable to allow longitudinal movement of said mandrel in said second direction relative to said sleeve assembly to unset said packer for retrieval thereof; and

an equalizing fluid passageway selectively operable to provide fluid communication above and below said sleeve assembly;

said sleeve assembly including at least one packing element selectively compressible into sealing engagement with the well bore, at least one slip selectively engageable with the well bore, and drag block means engaging said well bore to facilitate setting of said at least one packing element and at least one slip to set said packer within the well bore;

said connector sub selectively detachable from said mandrel to leave said packer in the well bore, tension applied by

the running tool to said sub being transmitted to said mandrel for closing said equalizing fluid passageway and setting said packer, said sub reconnectable to said mandrel for opening said passageway, release of said locking ratchet means and retrieval of said packer.



4,984,637

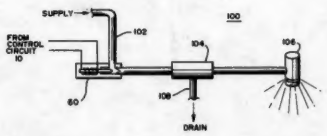
ELECTRONIC FIRE PROTECTION SYSTEM

Wilfred J. Finnigan, RR7-S4-C27, Vernon, British Columbia, Canada V1T 7Z3

Filed Jun. 23, 1989, Ser. No. 370,825

Int. Cl.[5] A62C *39/00*

U.S. Cl. 169—61 **15 Claims**



1. A fire protection system comprising:

electronic temperature responsive sensing means disposed in an area to be protected;

control circuit means having an input connected to said sensing means and an output, and including means to generate an output signal when the temperature in an area to be protected exceeds a first set point;

means connected to said output and responsive to said output signal to operate a fire extinguishing system when the temperature in an area to be protected exceeds the first set point; and,

means in said control circuit to discontinue said output signal when the sensed temperature is reduced below a second set point substantially below said first set point, and thereby disable the fire extinguishing system.

4,984,638

PLOW WITH SYMMETRICAL BODIES HAVING CONCAVE VERTICAL AND HORIZONTAL CROSS-SECTIONS

Denis Coste, 24 rue Georges Denance, 93270 Sevran, France

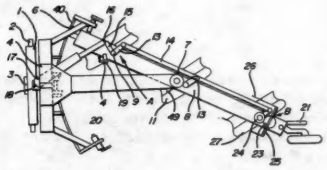
PCT No. PCT/FR87/00308, § 371 Date Feb. 10, 1989, § 102(e) Date Feb. 10, 1989, PCT Pub. No. WO88/01129, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 6, 1987, Ser. No. 333,629

Claims priority, application France, Aug. 12, 1986, 86 11621; Aug. 27, 1986, 86 12143; Nov. 19, 1986, 86 16114; Jan. 14, 1987, 87 00347; Apr. 15, 1987, 87 05312

Int. Cl.[5] A01B *3/40, 15/08*

U.S. Cl. 172—221 **2 Claims**



1. A plow system adapted to be pulled by a pulling means and further adapted for two-way plowing whereby the plow will throw plowed earth in a first geographic direction to a first side of the pulling means when the pulling means advances in a first geographic sense, and, when the pulling means returns in a second geographic sense, 180° from the said first geographic sense, will throw plowed earth in the same said first geographic direction but to the opposite side of the returning pulling means, the plow system including:

at least one moldboard (11);

a first support means (10) for supporting said moldboard (11), said first support means (10) being operatively connected to said moldboard (11);

a second support means for supporting said first support means, said second support means including a main beam (8), the first support means being pivotably connected to the second support means;

means for connecting (1, 4) said second support means to the said pulling means so that the second support means is positioned at an acute angle to the direction of travel of said pulling means with the forward portion of the second support means directed to one side of the pulling means when the pulling means advances in a first geographical sense so as to throw plowed earth in said first geographical direction;

means for altering (17, 18) the relation of the second support means to the pulling means so that the forward portion of the second support means is directed to the opposite side of the pulling means when the pulling means returns in a second geographical sense, 180° from the said first geographical sense so as to throw plowed earth in the same said first geographical direction;

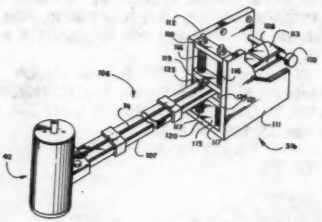
said moldboard (11) having a surface which contacts and throws the earth being plowed which is at least partially concave, this concave surface being concave in its hori-

zontal section (46) as well as being concave in its vertical section (47), wherein the said surface of the moldboard has a concavity in its horizontal section which has a substantially shorter radius of curvature at the upper portion of the moldboard than at the lower portion of the moldboard.

4,984,639
DEMOLITION HAMMER

Edgar F. Lindsey, 10370 Worthington Hills Manor, Roswell, Ga. 30076, and Stephen G. Moran, Atlanta, Ga., assignors to Edgar F. Lindsey, Buford, Ga.

Filed Sep. 29, 1989, Ser. No. 414,717
Int. Cl.[5] E21C *27/30*
U.S. Cl. 173—100 **6 Claims**



1. A hammer apparatus for attachment to a machine such as a backhoe or the like having an implement attached at an end of an articulated arm, the apparatus comprising:

adapter means selectively attachable to the arm in place of the implement;

a cantilever spring having one end mounted for pivotable movement relative to the adapter means and extending outwardly therefrom to a remote end;

impact tool means disposed at the remote end of the cantilever spring for impacting a workpiece as the articulated arm moves the adapter means; and

secondary spring means urging the cantilever spring to a predetermined nominal pivotable attitude relative to the adapter means and resiliently yielding to permit the cantilever spring a limited pivotable movement as the adapter means is moved;

the cantilever spring being sufficiently elastic to impart a whipping action as the cantilever spring moves the impact tool towards the workpiece, so that the whipping action intensifies the impact delivered to the workpiece by the tool.

4,984,640
POWER POST DRIVER AND HAMMER

Leland E. Gillan, 6065 Xenophon St., Arvada, Colo. 80004, and Robert J. Wagner, Rte. 1, Box 35H, Commerce City, Colo. 80022

Filed Feb. 26, 1990, Ser. No. 484,580
Int. Cl.[5] B23B *45/16*
U.S. Cl. 173—123 **2 Claims**

1. A power driver and hammer comprising in combination:

a. a tubular member with one end capped off where by a portion of a post or an impact tool is inserted inside said tubular member to the point of contact with the capped end of said tubular member and holds the post or tool in place with gravity or a retaining mechanism;

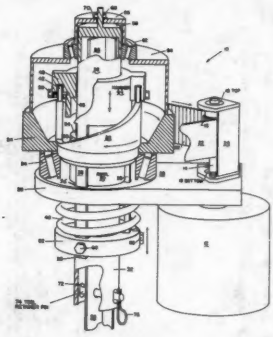
b. a hammer element surrounding the perimeter of said tubular member and sliding on the said tubular member in a reciprocating motion;

c. a cylindrical cam having a cam profile including a rising portion terminating in an abrupt drop, said cylindrical cam being concentrically mounted for rotation about said tubular member as an axis;

d. a spring surrounding the perimeter of said tubular member;

e. a cam follower assembly connected to said hammer element and connected to said spring, said spring urging said cam follower assembly against said cam profile;

f. means for rotating said cylindrical cam about said tubular member;

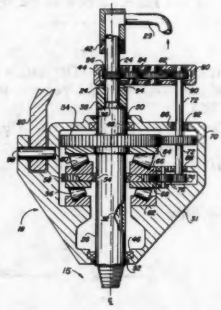


g. an anvil element surrounding and attached to the perimeter of said tubular member, and situated to be struck by said reciprocating hammer element evenly around the perimeter of said tubular member, conveying said hammer element striking energy to said anvil, and further transmitting the said hammer element energy to the capped end of said tubular member and to said post or said impact tool; whereby the center of gravity of said power post driver and hammer is within, for practical purposes, said post or said impact tool, and the impact of said hammer onto said anvil surrounds said post or said impact tool.

4,984,641
SWIVELS

Dale H. Pryor, 1311 W. 7th St., Plainview, Tex. 79072

Filed Feb. 7, 1990, Ser. No. 476,073
Int. Cl.[5] E21B *3/02*
U.S. Cl. 175—170 **19 Claims**



1. A swivel for supporting a rotating drill string and for conducting flow from a fixed source into the swivel and into a drill string;

said swivel has a main body, a passageway formed through said main body; a hollow, elongated sleeve mounted

within said passageway for rotation about its longitudinal axis, means at the lower end of said sleeve for connection to a drill string; a driver gear affixed to said sleeve;

a shaft, a first and a second gear affixed to said shaft, means by which the first shaft gear is driven by said driver gear;

an upper and lower thrust bearing, a middle race positioned between said upper and lower thrust bearings; means by which said sleeve is supported for rotation by said upper thrust bearing, said middle race is supported by said lower thrust bearing; and, said main body supports said lower thrust bearing;

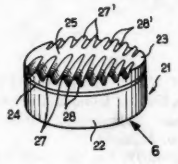
means by which said middle race is driven by said second gear in an opposite direction respective to said sleeve; whereby, the rate of rotation of the first and second thrust bearings about the sleeve is less than the rate of rotation of the sleeve, thereby reducing the centrifugal force of the first and second bearings.

4,984,642

COMPOSITE TOOL COMPRISING A POLYCRYSTALLINE DIAMOND ACTIVE PART

Paul Renard, Uriage, and Jean Sionnet, Saint Egreve, both of France, assignors to Société Industrielle de Combustible Nucléaire, Annecy, France

Filed Nov. 27, 1989, Ser. No. 441,745
Claims priority, application France, May 17, 1989, 89 06435
Int. Cl.[5] E21B *10/46*
U.S. Cl. 175—329 **4 Claims**



1. Composite tool comprising a metal carbide support and a polycrystalline diamond active part having an inner surface of metallurgical connection to said support and an outwardly facing working surface, said working surface comprising corrugations which are substantially parallel with one another and constitute successive projecting zones and hollow zones and an outer end portion of said active part of said tool being located on a spherical dome surface, said spherical dome surface comprising said corrugations being disposed in two peripheral zones and a smooth surface in a central zone of said spherical dome surface.

4,984,643

ANTI-BALLING EARTH BORING BIT

Matthew R. Isbell, and Rudolf C. O. Pessier, both of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

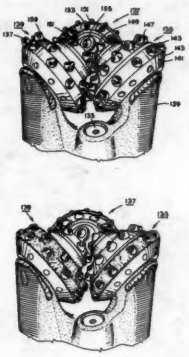
Filed Mar. 21, 1990, Ser. No. 496,820
Int. Cl.[5] E21B *10/08, 10/16*
U.S. Cl. 175—341 **10 Claims**

1. An earth boring bit with a body adapted for attachment to a drill string:

three cantilevered bearing shafts extending downwardly and inwardly, each at a selected pin angle relative to the rotational axis of the bit;

a cone rotatably secured to each bearing shaft and having circumferential rows of earth disintergrating teeth of wear resistant inserts with ends having a selected projection from the surface of the cone;

a first cone having a heel row and an inner row separated from the heel row by a narrow circumferential groove that tends to ball with cuttings during drilling;



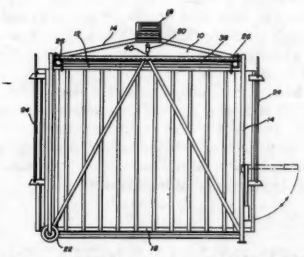
a second cone having a hell-catching row that extends into the narrow groove with an intermesh in an amount effective to minimize balling in the narrow groove.

4,984,644

OVERHEAD LEVER TORQUE SUSPENSION WEIGHING SCALE

Robert E. Skibinski, Tompkinsville, Ky., assignor to Mid-America Scale, Inc., Tompkinsville, Ky.

Continuation-in-part of Ser. No. 298,915, Jan. 19, 1989. This application Jun. 28, 1989, Ser. No. 372,563
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[5] G01G *19/52*
U.S. Cl. 177—132 **12 Claims**



1. An apparatus for securely fastening a torque suspension member to a main frame and a weighbridge/animal crate in a torque suspension weighing scale comprising:

weigh cable means separately surrounding said torque suspension member at a predetermined location thereof;

a ball member fixed to each exposed end of said weigh cable means;

a seat retention member axially movable along said weigh cable means and corresponding to each said ball member;

wherein said ball member fits within said seat retention member to form a ball and seat retention assembly; and

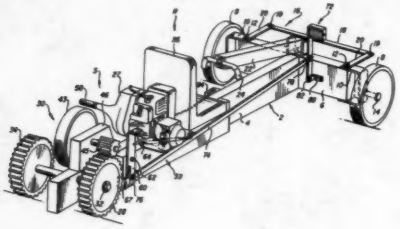
means for supporting said ball and seat retention assembly with respect to each said weighbridge/animal crate and said main frame when torque is applied to said torque suspension member in response to force applied to said weighbrige/animal crate.

4,984,645

VEHICLE AND POWERTRAIN THEREFOR FOR USE BY CHILDREN

John A. White, Jr., 5249 Spinning Wheel Ct., Grand Blanc, Mich. 48439

Filed Sep. 21, 1989, Ser. No. 410,422
Int. Cl.[5] B60K *1/00*
U.S. Cl. 180—65.6 16 Claims



1. A vehicle, comprising:
(a) a main frame;
a pair of front wheels and at least a rear wheel operably associated with said frame for engagement with the ground;
(c) means for steering the vehicle;
(d) a seat associated with said frame for an operator;
(e) an engine including a drive shaft;
(f) means for mounting said engine to said main frame;
(g) torque converter operably associated with said drive shaft and said at least rear wheel;
(h) said mounting means including a first position whereby said drive shaft is in driving engagement with said torque converter and a second position whereby said drive shaft is in disengagement from said torque converter;
(i) means operably associated with said mounting means for stopping the vehicle and having operative and non-operative positions such that when said stopping means is in said non-operative position, said drive shaft is in said first position and when said stopping means is in said operative position, said drive shaft is in said second position;
(j) said mounting means including a bracket pivotally secured to said frame;
(k) said bracket including first and second ends;
(l) said first end being operably associated with said engine, thereby permitting said engine and said drive shaft to move between said first and second positions; and
(m) said bracket second end including a brake plate normally engaged against said at least rear wheel.

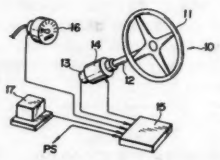
4,984,646

STEERING SYSTEM FOR MOTOR VEHICLE

Shoichi Sano; Yoshimi Furukawa, both of Tokyo; Akihiko Takei, Saitama; Yutaka Nishi, Saitama, and Yasuaki Ohno, Saitama, all of Japan, assignors to 501 Honda Giken Kogyo Kabushiki Kaisha, Minato, Japan

Filed Mar. 14, 1989, Ser. No. 323,496
Claims priority, application Japan, Mar. 14, 1988, 63-61670
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—79.1 9 Claims

1. A steering system for a motor vehicle having power steering means including
an actuator for turning steerable road wheels of the motor vehicle,
said steering system comprising:
direction indicating means
for indicating a desired direction of travel of the motor vehicle
with respect to a reference direction of the motor vehicle;
direction detecting means
for detecting an actual direction of travel of the motor vehicle; and
control means responsive to
an output signal from said direction indicating means and
an output signal from said direction detecting means
for controlling said power steering means
to eliminate a deviation between
said desired direction and
said actual direction based on said output signals;



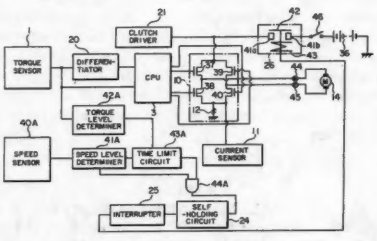
said direction indicating means including
a steering wheel mechanically separate from said steerable road wheels and which is not biased to rotate in either direction so the steering wheel remains in a position to which it has been moved by an operator after turn of the vehicle has been completed and the wheels have returned to a neutral position; and
said direction indicating means being operable to indicate a desired absolute direction in which said motor vehicle is to travel.

4,984,647

ELECTRIC POWER STEERING APPARATUS

Mitsuharu Morishita; Kosaku Uota, and Takeshi Yasukawa, all of Himeji City, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 344,579, Apr. 28, 1989, Pat. No. 4,957,182.
This application Jun. 4, 1990, Ser. No. 532,407
Claims priority, application Japan, Apr. 28, 1988, 63-108132
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—79.1 3 Claims



1. An electric power steering apparatus for a vehicle comprising:
an electric motor which can be connected to a steering gear of a vehicle so as to steer the vehicle;
a steering torque sensor for sensing a steering torque applied to a steering shaft by a driver of the vehicle and generating a corresponding output signal;
control means for determining a proper rotational direction of said motor based on the output signal of said torque sensor and generating a drive direction signal indicating the direction in which said motor should rotate;
a motor driver which is responsive to said control means and

drives said motor in the direction indicated by the drive direction signal;

a torque level determiner which determines when the level of the steering torque applied by the driver of the vehicle exceeds a prescribed torque based on the output signal of said steering torque sensor;

a vehicle speed level determiner which determines when the speed of the vehicle exceeds a prescribed speed;

time limit means for establishing a time limit; and

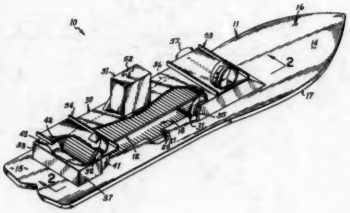
interrupter means responsive to said torque level determiner, said vehicle speed level determiner, and said time limit means for preventing current from being supplied to said motor driver when the speed of the vehicle exceeds the prescribed speed and the torque applied by the driver exceeds the prescribed torque for at least the time limit.

4,984,648

MOTORIZED SKIBOARD

Michael Strzok, 457 Wilson Creek Rd., Lawrenceburg, Ind. 47025

Filed Dec. 21, 1988, Ser. No. 288,007
Int. Cl.[5] A63C *5/08*
U.S. Cl. 180—181 **6 Claims**



1. A motorized skiboard comprising a skiboard having a top plane, a bottom plane and a central opening extending through said top plane and bottom plane, a motor drive belt, drive belt mounting means mounting said drive belt centered relative to said opening

a throttle means adapted to control said motor;

said drive belt including a plurality of drive bars, pivotally mounted to said belt whereby said belt is mounted relative to the board so that said drive bars extend beyond the bottom plane of the board when in ground engaging position and ride at the bottom plane of the board when in a sliding position;

wherein said drive belt comprises a plurality of trapezoidal links, each trapezoidal link having a downwardly extending arm and a land portion and an upwardly extending arm and

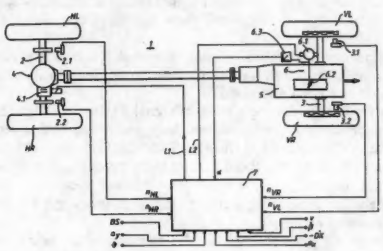
said drive bars having a planar portion and a plurality of vertically inclined arm portions pivotally attached to said trapezoidal links whereby when said drive bars are in a sliding position said arm portions of said drive bars are parallel to the downwardly extending arm portions of said trapezoidal links and said planar portion of said drive bars are parallel to and resting against said land portion of said trapezoidal link; and whereby when said drive bar is in a ground engaging position said planar portion is perpendicular to the land portion of said trapezoidal links.

4,984,649

MOTOR VEHICLE WITH AN AUTOMATIC LIMITED-SLIP DIFFERENTIAL

Heinz Leiber, Oberriexingen; Hans Ohnemüller, Reutlingen; Klaus Kastner, Stuttgart, and Karl-Heinz Richter, Kernen, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Sep. 18, 1989, Ser. No. 409,001
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1988, 3831690
Int. Cl.[5] B60K *17/34*
U.S. Cl. 180—197 **6 Claims**



1. In combination with a motor vehicle having a vehicle engine of a drive system which acts on vehicle wheel of an axle via an automatic slip limiting differential means in dependence on a driving speed of the vehicle and slip of drive wheels, the slip limiting differential means including rotational speed sensor means for sensing a rotational speed of each vehicle wheel and a control logic circuit means for generating control signals for connecting and disconnecting the slip limiting differential means, a wheel slip control means for acting exclusively on a drive torque of the vehicle engine in dependence on the slip of the wheels, the control logic circuit means operating in response to threshold signals generated by several different threshold value comparator means and signal transmitter means, the combination further comprising:

means for generating a control signal a when slip of the vehicle wheels occurs unilaterally and the vehicle speed is less than a first speed threshold value;

means for generating a control signal b when slip of the vehicle wheels occurs unilaterally and the vehicle speed is greater than the first speed threshold value and less than a third speed threshold value greater than the first speed threshold value;

means for generating a control signal c when a braking signal is generated by one of the signal transmitter means and the vehicle speed is below a second speed threshold value;

means for generating a control signal d when slip of the vehicle wheels occurs unilaterallY, the vehicle speed is greater than the third speed threshold value greater than the second speed threshold value and a predetermined value of one of a steering angle threshold and a first lateral acceleration threshold has not been exceeded.

means for generating a control signal e when no unilateral slip of the vehicle wheels occurs, the vehicle speed is less than a fourth speed threshold value greater than the third speed threshold value, a predetermined threshold of a longitudinal acceleration threshold has not been exceeded, and at least one of the steering angle threshold, and the first lateral acceleration threshold has not been exceeded;

means for generating a control signal f when one of the signal transmitters generates an accelerator release signal the vehicle speed is greater than the second speed threshold value and a third lateral acceleration threshold greater than the first lateral acceleration threshold has been exceeded;

means for generating a control signal g when there is no unilateral slip of the vehicle wheels, the vehicle speed is greater than the fourth speed threshold value, and the predetermined threshold of one of the steering angle threshold and the first lateral acceleration threshold has not been exceeded;

means for generating a control signal h when slip of the vehicle wheels occurs unilaterally and the vehicle speed is greater than the fourth speed threshold value and the predetermined threshold of one of the steering angle threshold and the first lateral acceleration threshold has not been exceeded;

means for generating a control signal i when a braking signal is generated by one of the signal transmitter means and the vehicle speed is greater than the third speed threshold value;

means for generating a control signal k when a predetermined threshold value of a sideslip angle velocity threshold has been exceeded;

means for generating a control signal l when the first lateral acceleration threshold has been exceeded and a second lateral acceleration threshold greater than the first lateral acceleration threshold has not been exceeded during a first control cycle of the wheel slip control means;

means for generating a control signal m when the wheel slip control means;

means for connecting the slip limiting differential means without delay when at least one control signal a, e, f, and g is generated;

means for connecting the slip limiting differential means with delay when at least one control signal b, c and d is generated;

means for disconnecting the slip limiting differential means with a time delay after at least one control signal a, b, c, d, e, f, and g is generated and removed;

means for disconnecting the slip limiting differential means without delay when at least one control signal h, i, k, and m is generated; and

means for reducing a slip threshold of the wheel slip control means if the control signal l is generated.

4,984,650

MOTORCYCLE

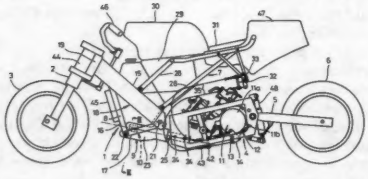
Satoru Horiike, Tokyo; Hiroo Takemura, Asaka, and Toshiteru Yamamoto, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1989, Ser. No. 327,452

Claims priority, application Japan, Mar. 23, 1988, 63-067213; May 16, 1988, 63-116861; Jun. 10, 1988, 63-141481

Int. Cl.[5] B62D *61/02*

U.S. Cl. 180—227 **16 Claims**



1. A motorcycle comprising:

a front wheel;

a rear drive wheel;

a power unit for driving said rear drive wheel;

a frame assembly supporting said power unit, said frame assembly including a front frame supporting said front wheel and a rear frame supporting said rear drive wheel, said front frame being coupled to said rear frame and swingable with respect to the rear frame laterally of said frame assembly, said rear wheel having a substantially flat tire for suppressing banking movement of said rear frame, said front wheel having a round tire for allowing banking movement of said front frame, a head pipe supporting a front fork by which said front wheel is supported on said front frame, said front frame is of a substantially V-shaped configuration when viewed in plan, said front frame having a front end connected to said head pipe at a vertex of said V-shaped configuration and having a rear end in which a coupling shaft is sandwiched between said V-shaped configuration, said coupling shaft connecting said front and rear frames to each other;

a seat mounted on said front frame; and

a damping means disposed between said front frame and said rear frame for damping banking movement of said front frame.

4,984,651

PASSENGER RESTRAINT SYSTEM

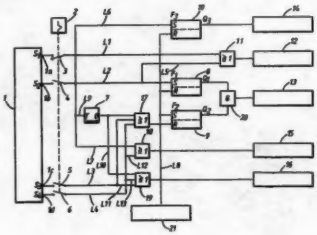
Lothar Grösch, Stuttgart; Falk Zeidler, Sindelfingen; Egon Katz, Nagold, and Alban Bossenmaier, Gäufelden, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Feb. 8, 1990, Ser. No. 478,839

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1989, 3904668

Int. Cl.[5] B60R *21/18, 22/46, 21/32*

U.S. Cl. 180—268 **19 Claims**



1. Passenger restraint system for motor vehicles comprising:

at least one safety belt including a lap belt portion and a shoulder belt portion for which belt tensioner means is provided;

at least one airbag;

at least one switch means is a belt lock of the safety belt for detecting a functional position of the safety belt;

a sensor which transmits threshold signals at least in dependence on effective changes of speed of the vehicle;

wherein an activation of the airbag and of the belt tensioner means takes place in dependence of a functional position of the safety belt as detected by the switch means;

wherein there is an activatable belt-clamping device on the belt lock and an activatable belt pull-out detent for the shoulder belt portion of the safety belt;

wherein the sensor transmits at least three different threshold signals; and

wherein there is a control unit means which, when the safety belt is fastened and when a second of the three threshold signals occurs to indicate a moderate to serious accident, releases the airbag, arrests the belt-clamping device and releases the belt pull-out detent during an operative releasing period of the airbag and which, when the safety belt is fastened and when the third threshold signal occurs to indicate a very serious accident, arrests the belt pull-out detent.

4,984,652

TORSIONAL WAVE LOGGING TOOL

Michael L. Batzle, and Kenneth M. Tubman, both of Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 13, 1989, Ser. No. 297,167
Int. Cl.[5] G01V 1/40
U.S. Cl. 181—104 10 Claims

1. Apparatus for determining the shear velocity of an earth formation in the vicinity of a wellbore penetrating said formation and wherein said wellbore is filled at least partially with a liquid medium, said apparatus comprising:

a support member adapted to be lowered into said wellbore and in said liquid medium, said support member adapted to support at least one transducer element for generating acoustic pulses for transmission through said liquid medium toward a wall of said wellbore;

receiver means spaced axially along said wellbore from said transducer element and including means for sensing torsional deflection of said formation with respect to a longitudinal central axis of said wellbore;

said transducer element being positioned on said support member for transmitting a pulse at a selected frequency toward the wall of said wellbore and which pulse, in a plane normal to said axis, impinges said wall at an angle of incidence to said wall with respect to a normal to said wall and which normal intersects said axis, said angle of incidence being greater than zero degrees so as to impart a torsional deflection to said formation with respect to said axis and whereby the elapsed time between the transmission of said pulse and the receipt of a signal related to the deflection of said formation is measurable to determine the shear velocity of said formation between said transducer element and said receiver means.

4,984,653

LOUDSPEAKER ARRANGEMENT

Wolfgang Spors, Schilfgraben 21, D-2150 Buxtehude, Fed. Rep. of Germany

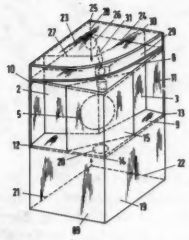
PCT No. PCT/DE87/00447, § 371 Date Jun. 1, 1989, § 102(e) Date Jun. 1, 1989, PCT Pub. No. WO88/04514, PCT Pub. Date Jun. 16, 1988
PCT Filed Oct. 2, 1987, Ser. No. 364,433
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1986, 3641094
Int. Cl.[5] H05K 5/00
U.S. Cl. 181—148 19 Claims

1. A loudspeaker apparatus where sound emitted by one or more loudspeakers is directed by and through said apparatus prior to emission therefrom, said apparatus comprising:

a sound generating means for creating sound,

a generally planar vertically oriented baffle carrying said sound generating means so that the sound created thereby is projected rearwardly from said baffle along a sound projection path having a generally horizontal center axis and covering a significant portion of a plane transverse to said axis,

means providing two generally planar vertically extending guide surfaces for guiding and reflecting said sound, said guide surfaces being spaced rearwardly of said baffle and lying in separate planes, said guide surfaces having comparable vertical heights and being inclined towards one another at an obtuse angle so that their planes intersect in a generally vertical line, and said guide surfaces further being positioned relative to said sound projection path that a line which bisects said obtuse angle and is located at a level approximately midway along said height of said intersection line is substantially aligned with said center axis of said sound projection path, said basic guide surfaces and said sound generating means being further so relatively positioned that said sound first travels generally rearwardly from said baffle until being reflected at and divided by said guide surfaces into two separate portions each thereupon travelling in a direction extending generally forwardly from said guide surfaces and laterally and forwardly of said baffle, and



means providing two horizontal generally planar sound guide surfaces for further directing said sound from said sound generating means, one of said horizontal sound guide surfaces being an upper surface located above said sound generating means and the other of said horizontal guide surfaces being a lower surface located below said sound generating means, said horizontal surfaces being vertically spaced from one another and from said sound generating means and each extending horizontally at least from said baffle to said vertical basic sound guide surfaces, said basic sound guide surfaces extending vertically between said horizontal guide surfaces.

4,984,654

SCAFFOLD SAFETY SYSTEM

Carl Anderson, c/o Alum-A-Pole Corporation 2589 Richmond Ter., Staten Island, N.Y. 10303

Filed May 10, 1990, Ser. No. 521,573
Int. Cl.[5] E04G 1/20, 1/30
U.S. Cl. 182—179 18 Claims

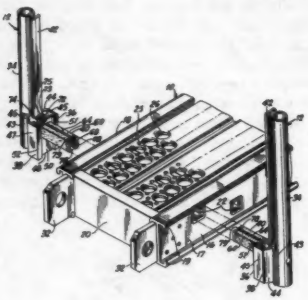
1. A guard post module comprising a guard post and means for coupling said post to a scaffold platform comprising:

a bracing member attached to said post and

a plug member carried by a portion of said bracing member and extending perpendicular to said post, said plug member having an external elongated resilient sleeve,

said coupling means having means for axially constricting

said sleeve to cause the dimensions of said sleeve to be transversely expanded, whereby said plug member may be



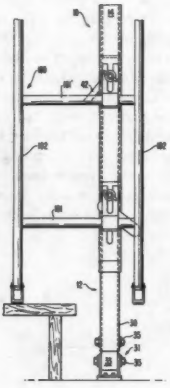
inserted and clamped within a hollow rung of a scaffold platform.

4,984,655

LADDER ADJUSTMENT APPARATUS

Mark D. Scherer, 11313 Newland St., Westminster, Colo. 80020, and Thomas A. Hoy, 2906 Stuart St., Denver, Colo. 80212

Filed Feb. 23, 1990, Ser. No. 483,846
Int. Cl.[5] E06C *7/44*
U.S. Cl. 182—204 **10 Claims**



1. A ladder adjustment apparatus for ladders having a pair of vertical legs connected together by rungs wherein the ladder adjustment apparatus comprises:

an outer tubing member provided with a pair of rung capturing members which are adapted to captively engage rungs on said ladder; wherein the pair of rung capturing members comprise: a stationary rung capturing member disposed at a fixed location on the outer tubing member; and, an adjustable rung capturing member which is vertically displaceable relative to said outer tubing member; wherein both of said rung capturing members are rotatably disposed relative to said outer tubing member;

an inner tubing member slideably disposed within said outer tubing member and provided with a foot element on the lower end of the inner tubing member; and

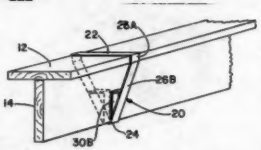
a locking unit operatively associated with said inner and outer tubing members for varying the relative position between the inner and outer tubing members to adjust the vertical height of the apparatus.

4,984,656

BRACE FOR SCAFFOLDING PLANK

Leonard L. Doolittle, 8597 Leatherman Rd., Wadsworth, Ohio 44281

Filed May 15, 1990, Ser. No. 524,086
Int. Cl.[5] E04G *5/08*
U.S. Cl. 182—222 **8 Claims**



1. A brace for increasing the beam deflection resistance of a primary plank by removably positioning at least one secondary plank against said primary plank in a perpendicular relationship, each said plank having dimensions of width, length and thickness, said brace comprising:

a closed frame member, having an essentially isosceles trapezoidal cross section, comprising a first base piece, a second base piece, and two side pieces, each said base piece and side piece having respective first and second ends;

said first base piece being essentially as long as the width of the primary plank and having its respective first and second ends affixed at right angles to the respective first ends of said two side pieces;

said second base piece being essentially as long as the thickness of at least one secondary plank and having its respective first and second ends affixed to the respective second ends of one of said two side pieces;

each said side piece consisting of a first and a second straight portion with an obtuse angle formed between said straight portions, said first straight portion being at the first end of said side piece and being at least as long as the thickness of said primary plank, said second portion being at the second end of said side piece and being of proper length and said obtuse angle being of proper angularity to form the isosceles trapezoidal cross section such that the height of said trapezoid is at least equal to the sum of the thickness of said primary plank and the width of said secondary plank.

4,984,657

SERVICE LIFT STAND APPARATUS FOR SMALL TRACTORS

Richard H. Burns, 662 Clarendon Rd., Troy, Ohio 45373

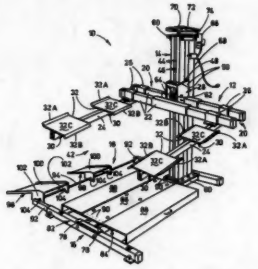
Filed Jul. 28, 1989, Ser. No. 387,126
Int. Cl.[5] B66F *7/14*
U.S. Cl. 187—8.47 **20 Claims**

1. A service lift stand apparatus, comprising:

(a) a lift assembly including a pair of spaced lift arms and a pair of individual support pads mounted on each lift arm, each lift arm being separate from and unconnected with one another and said support pad pair on one lift arm being separate from and unconnected with said support pad pair on the other lift arm so as to define an unoccupied work space located between and coextensive with said lift arms through which to reach the underside of a vehicle supported across said lift arms by said pairs of support pads;

(b) an upright mast assembly supporting said lift assembly and said lift arms thereof in a cantilever fashion from said upright mast assembly for movement therealong between a lowered loading and unloading position and a raised servicing position; and

(c) a base assembly including a base frame rigidly mounting said mast assembly in an upright orientation from one end of said base frame for supporting said mast assembly and said lift assembly therewith above a support surface, said base assembly further including a platform supported



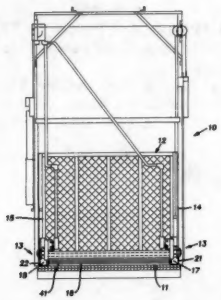
upon said base frame, said platform being composed of a stationary main platform section and a pair of platform end sections placed at a pair of opposite ends of the main platform section and adjustably movable relative thereto to change the size of said platform.

4,984,658

CAR GATE REVERSING EDGE

H. E. Peelle, Jr., Manhasset; I-Lin Chang, Setauket, and Stefan Walkowiak, St. James, all of N.Y., assignors to The Peelle Company, Bay Shore, N.Y.

Filed Jan. 22, 1990, Ser. No. 468,226
Int. Cl.[5] B66B *13/24*
U.S. Cl. 187—58 **7 Claims**



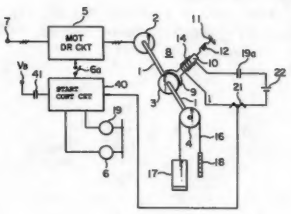
7. A method of controlling an automatic power-operated closure on an elevator car comprising providing a radiation beam projector and a beam receiver adjacent opposite ends of the closing edge of the closure, movably supporting the projector and receiver on the closure to establish a radiation beam parallel to and ahead of the closing edge of the closure at a predetermined distance sufficient to sense an interfering object in the path of the closure by interruption of the beam during closing motion and provide a signal sufficiently early to permit the power operator of the closure to stop or reverse the motion of the closure before it strikes the interfering object, and when the closing edge of the closure is within a distance approximating said predetermined distance or less than said predetermined distance, arresting the movement of said beam projector and receiver relative to said car such that said projector and receiver retract relative to said closure while establishing a beam substantially at the line of contact said closing edge makes with said car in its closed position.

4,984,659

ELEVATOR CONTROL APPARATUS

Masami Nomura, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 30, 1989, Ser. No. 302,947
Claims priority, application Japan, Feb. 1, 1988, 63-21520; Oct. 18, 1988, 63-260642
Int. Cl.[5] B66B *1/32*
U.S. Cl. 187—108 **16 Claims**



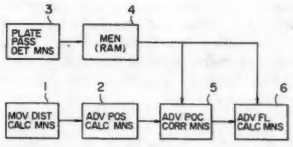
1. An elevator control apparatus comprising:
a brake in which a brake coil is deenergized, thereby to generate a braking force so as to brake an elevator cage, and said brake coil is energized in response to a start command signal, thereby to release the braking force;
current sensing means for sensing change in a current of said brake coil as based on change in an inductance thereof after the current has reached a predetermined value, and delivering an actuating signal, when the braking force of said brake is released; and
a drive circuit which, when supplied with the actuating signal, feeds electric power for generating a rotating torque to a motor for driving said elevator cage.

4,984,660

APPARATUS FOR CONTROLLING AN ELEVATOR

Satomi Ikejima, and Shigemi Iwata, both of Inazawa, Japan, assignors to Mitsubishi Kenki Kabushiki Kaisha, Japan

Filed Apr. 14, 1989, Ser. No. 338,219
Claims priority, application Japan, Apr. 15, 1988, 63-92752
Int. Cl.[5] B66B *3/02*
U.S. Cl. 187—134 **8 Claims**



1. An apparatus for controlling an elevator comprising:
a plate provided before a cage stopping position of each floor in an elevator shaft;
plate passage detecting means for outputting a position signal when the cage passes each plate;
a memory for storing position information of plates to be read in accordance with said position signals;
advance position calculating means for calculating a time-dependent advance position based on the elapsed time since the separation of the elevator cage from a stopping floor;
advance position correcting means for correcting the time-dependent advance position in accordance with the plate position information read from said memory when said

position signal is output to obtain a real advance position; and

advance floor calculating means for comparing the real advance position with the plate position information to produce a cage advance floor.

4,984,661

MULTIPLE DISC BRAKE

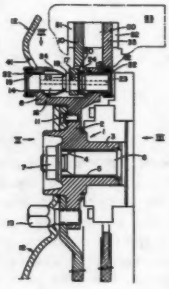
Guy Meynier, Aulnay Sous Bois, France, assignor to Bendix France, Drancy, France

Filed Apr. 24, 1989, Ser. No. 342,913

Claims priority, application France, Apr. 28, 1988, 88 05653

Int. Cl.[5] F16D *55/36*

U.S. Cl. 188—71.5 **3 Claims**



1. A brake comprising a wheel hub, a stationary first disc fixed to the wheel hub, a movable second disc coaxial relative to the first disc and integral with the hub in terms of rotation but capable of moving axially in relation to the stationary first disc, a first brake lining located between the two discs, a second brake lining located on a side of the first disc opposite the second disc, a third brake lining located on a side of the second disc opposite the first disc, and a caliper equipped with means for clamping the linings on the discs, wherein said hub carries at least three pairs of bearings which are arranged uniformly relative to the wheel axis, the hub comprising a central plate carrying the pairs of bearings by means of an extension in the form of a fork, the bearings of each pair of bearings having a common axis parallel to said wheel axis, a shaft being mounted slideably on the two bearings of each pair of bearings, a hanger mounted fixedly in terms of translational movement on each of said shafts and located approximately half-way between opposite ends of the respective shaft, each shaft enclosed in a sealed chamber by means of flexible collar means connecting each bearing with a corresponding hanger and by means for externally sealing the bearings, and each hanger connected rigidly to the movable second disc.

4,984,662

SELF SUPPORTING, SELECTIVELY COLLAPSIBLE SOFT-WALLED CARRIER

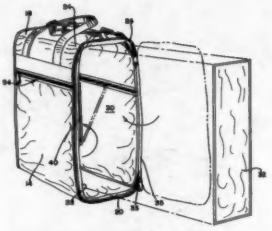
Jeffrey M. Jacober, South Kingston, R.I., assignor to SGI Inc., Warwick, R.I.

Filed Dec. 27, 1989, Ser. No. 457,341

Int. Cl.[5] A45C *7/00, 13/02, 13/08*

U.S. Cl. 190—107 **21 Claims**

1. A self-supporting soft walled carrier comprising: a plurality of pliable panels including an upstanding end panel, a pair of upstanding side panels, a top panel and a bottom panel, said panels being joined together at their respective edges to form a shaped compartment body defining an inner body cavity having a generally rectangular mouth opening opposite the end panel, said carrier including a generally rectangular end cover panel for selectively opening and closing said mouth opening and a removable end panel insert dimensioned for selective abutting engagement against said end panel within the body cavity, said side panels, top panel, bottom panel, and end cover panel each having a resilient pliable construction and said carrier further including closure means for securing the end cover panel to said body, said closure means selec-



tively joining or disjoining less than the full generally rectangular periphery of the end cover panel, the remainder of said full periphery including means for hingeable attachment to the body of the carrier, and said carrier body including means for rendering it self supporting in the absence of rigid framing.

4,984,663

TRANSFER APPARATUS FOR 4-WHEEL DRIVING

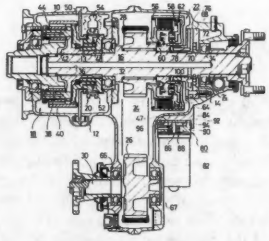
Tadahiko Kato, Kosai, Japan, assignor to Fuji Tekko Co., Ltd., Shizuoka, Japan

Filed Feb. 12, 1990, Ser. No. 478,497

Claims priority, application Japan, Mar. 7, 1989, 1-25704; Mar. 7, 1989, 1-25705; Apr. 5, 1989, 1-86627; Apr. 5, 1989, 1-86628

Int. Cl.[5] F16D *43/28*

U.S. Cl. 192—0.02 R **6 Claims**



1. A transfer apparatus for 4-wheel driving, comprising:

a main shaft to transfer a rotational force which was input from a transmission to a rear wheel side;

hydraulic clutch means for transferring a motive power rotation of the main shaft to a front wheel side;

pump means which is externally attached to a bottom portion side of a casing and generates an operating hydraulic pressure of the hydraulic clutch means; and

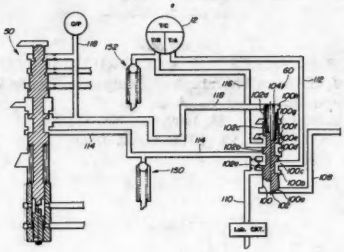
DC motor means for rotating the pump means.

4,984,664

HYDRAULIC SYSTEM FOR TORQUE CONVERTER WITH LOCK-UP CLUTCH

Kazuhiko Sugano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 31, 1988, Ser. No. 264,718
Claims priority, application Japan, Oct. 30, 1987, 62-273231
Int. Cl.[5] F16H *45/02*
U.S. Cl. 192—3.3 4 Claims



1. A hydraulic control system for a torque converter with a lock-up clutch, an apply chamber, and a release chamber, which chambers being defined by the lock-up clutch within the torque converter, the hydraulic control system comprising:

a lock-up clutch release circuit which is opened in response to an absence of a lock-up clutch engagement demand, allowing supply of hydraulic fluid to the release chamber within the torque converter and discharge of hydraulic fluid from the apply chamber within the torque converter;

a lock-up clutch engagement circuit, including a drain port, which is opened in response to the lock-up clutch engagement demand, allowing supply of hydraulic fluid to the apply chamber within the torque converter and discharge of hydraulic fluid from the release chamber;

a first relief valve means for preventing the pressure of the hydraulic fluid within said lock-up clutch engagement circuit from increasing above a first maximum predetermined value; and

a second relief valve means for preventing the pressure of the hydraulic fluid within said lock-up clutch release circuit from increasing above a second predetermined maximum value;

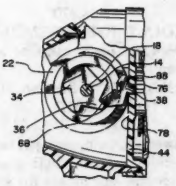
the setting being such that said first predetermined value is higher than said second predetermined value.

4,984,665

ANTI-REVERSE ACTUATOR FOR A SPINNING REEL

David Allis, Tulsa, Okla., assignor to Zebco Corporation, Tulsa, Okla.

Filed Dec. 14, 1989, Ser. No. 450,517
Int. Cl.[5] A01K *89/02*
U.S. Cl. 192—7 17 Claims



12. An anti-reverse mechanism for a rotating shaft, said anti-reverse mechanism comprising:

a plurality of ratchet teeth carried by said shaft;

a support;

a pawl;

means for mounting the pawl to the support for relative movement between (1) a first position wherein the pawl engages at least one of the ratchet teeth to prevent reverse rotation of the rotary shaft and (2) a second position wherein the rotary shaft can rotate forwardly without interference between the pawl and ratchet teeth;

an actuator having a continuous annular configuration surrounding the rotating shaft and a friction generating surface;

mean for mounting the actuator to the shaft so that the friction generating surface faces axially with respect to the shaft axis and the friction generating surface is in sliding frictional engagement with a part of the shaft; and

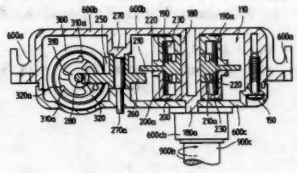
means on the actuator or engaging the pawl and for moving the pawl from its second position into its first position as an incident of the shaft reversely rotating and for moving the pawl from its first position to its second position as an incident of the shaft rotating in a forward direction.

4,984,666

SPEED GOVERNOR FOR TOILET OR THE LIKE

Makoto Orii, and Hiroyuki Iwashita, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Apr. 14, 1989, Ser. No. 337,808
Claims priority, application Japan, Apr. 14, 1988, 63-92336; Aug. 19, 1988, 63-206094; Aug. 19, 1988, 63-206095; Oct. 7, 1988, 63-253207
Int. Cl.[5] F16D *67/02*
U.S. Cl. 192—7 19 Claims



18. A speed governor for a toilet having a reciprocally pivotable member, said speed governor comprising:

an input shaft coupled substantially integrally to said reciprocally pivotable member;

brake means, responsive to an angular movement of said input shaft, for braking said angular movement of said input shaft

a one-way transmission clutch, provided between said brake means and said input shaft, for transmitting said angular movement of said input shaft to said brake means when said input shaft is angularly moved in a first direction, transmission of said angular movement of said input shaft to said brake means being prevented when said input shaft is angularly moved in a second direction opposite to said first direction; and

brake release means, provided between said input shaft and said brake means, for releasing an operation of said brake means at a final stage of said angular movement of said input shaft in said first direction.

4,984,667

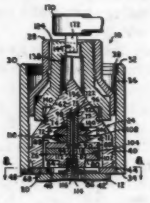
COUPLING DEVICE

Harold M. Tjaden, 221 Delaware, Stilwell, Kans. 66085

Filed Mar. 24, 1989, Ser. No. 328,530
Int. Cl.[5] F16D *7/02*; F16K *35/06*; B60R *25/00*
U.S. Cl. 192—56 R 10 Claims

2. A device for transmitting an input rotational force to an output shaft, which device comprises:

(a) a tubular housing including a bore with internal threads;
(b) a screw member including first and second ends and external threads threadably engaging said housing internal threads whereby said screw member is threadably and reciprocably mountable within said housing bore, said screw member further including a coxial bore open at said second end;



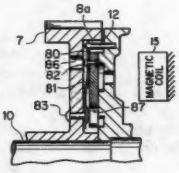
(c) slip clutch means positioned substantially within said screw member cooxial bore for interconnecting said screw member and said output shaft;
(d) socket means adapted for receiving a portion of said screw member first end and including engagement means adapted for drivingly engaging said screw member; and
(e) said screw member including engagement means adapted for driving engagement by said socket means.

4,984,668

ELECTRICALLY-POWERED DRIVE APPARATUS

Masayoshi Onishi, and Hiromasa Ozawa, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1989, Ser. No. 374,794
Claims priority, application Japan, Jul. 4, 1988, 63-88939[U]
Int. Cl.[5] F16D *27/10*
U.S. Cl. 192—84 C **1 Claim**



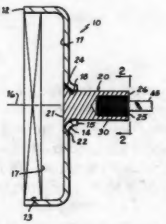
1. A clutch apparatus for an electrically powered drive apparatus, the drive apparatus having an output shaft which is engageable with a drive source through said clutch apparatus, said clutch apparatus comprising:
a first clutch plate coaxially secured to said output shaft and having a plurality of pins thereon, said pins projecting in the axial direction of said output shaft, said first clutch plate having a clutch coil associated therewith and being magnetized when said clutch coil is energized;
a gear loosely mounted to said output shaft oppositely to said clutch plate, said gear being rotatable relative to said output shaft;
a second clutch plate connected to said gear and adapted to be attracted by said first clutch plate and to be driven by said first clutch plate, wherein said second clutch plate comprises;
a resilient transmission member secured at a first portion thereof to said gear, said resilient transmission member being adapted to resiliently deflect, said resilient transmission member having teeth into which said pins extend in meshing engagement when said second clutch plate is attracted by said first clutch plate; and
a magnetically-attracted contact member secured to a second portion of said resilient transmission member, said contact member being attracted by said first clutch plate to thereby cause said pins to engage said teeth to transmit rotational force from said gear to said output shaft when said clutch coil is energized, said contact member being released to thereby return with the aid of the resiliency of said resilient transmission member.

4,984,669

DRUM ASSEMBLY FOR A CENTRIFUGAL CLUTCH

Ronald J. Hoffman, Phoenix, Ariz., assignor to Inertia Dynamics Corporation, Chandler, Ariz.

Filed Nov. 13, 1989, Ser. No. 433,706
Int. Cl.[5] F16D *13/62, 4/00*
U.S. Cl. 192—110 R **5 Claims**



1. A clutch drum assembly for a centrifugal clutch, said drum assembly having an axis of rotation, and comprising:
a generally cylindrical drum having an open end, a peripheral interior circular track, a central neck, and a passage through the neck said track extending concentrically around said axis, and adapted to be engaged by throw weights of a driver when the driver is rotated at a sufficient rotary velocity:
an output shaft fitted in said passage through said neck and brazed to said drum at said neck, said output shaft having a central, axially extending recess in its end away from said drum: and
a plurality of identical washers formed as a stack and inserted in said recess in interference and material-displacement relationship with the wall of the recess, each said washer having a central non-circular opening and a circular rim having a progression of sharp tooth-like serrations, the material of said washer being harder than the material of the output shaft, whereby said serrations can be embedded in said recess, and whereby the resistance of the washers at their openings to wearing forces from a user device coupled to said washers is greater than would be the resistance of a similar opening in the material of the output shaft.

4,984,670

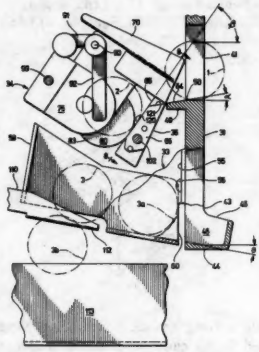
COIN DROP ASSEMBLY

Scott A. Merkle, Newton, Iowa, assignor to Maytag Corporation, Newton, Iowa

Filed Feb. 1, 1989, Ser. No. 304,470
Int. Cl.[5] G07D *5/08*
U.S. Cl. 194—317 **4 Claims**

1. A coin drop assembly, comprising: a face plate having first slot means for receiving coins including a predetermined acceptable coin and second slot means for returning other than said predetermined acceptable coin; slot modifying means on said face plate including a gage plate having formed structure corresponding to a predetermined range of coin diameters and movable with respect to said first slot means for modifying said

first slot means to prevent acceptance of coins exceeding the diameter of said predetermined coin; support means mounted on and extending rearwardly from said face plate; coin sensing means operable for determining the acceptability of a coin inserted into said first slot means and including induction coin means supported on said support means rearwardly spaced from said face plate; coin guide means including a first coin support portion extending rearward and downward at a first angle relative to said face plate and a second coin support portion extending rearward and downward at a second steeper



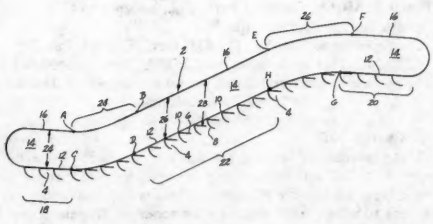
angle for guiding said inserted coin from said first slot means along a predetermined path between said face plate and said induction coil means; first means below said induction coil means defining a coin accept chute for said predetermined acceptable coin; second means below said induction coil means defining a coin reject chute communicating with said second slot means responsive to said induction coil means for providing a signal representative of the acceptability of said inserted coil; and means responsive to said circuit means for directing said inserted coin to one of said coin accept chute and said coin reject chute.

4,984,671

BALUSTRADE RADIUS DEVELOPMENT FOR CURVED ESCALATOR

Frank Sansevero, West Hartford, and Dat Nguyen, New Britain, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Jul. 11, 1990, Ser. No. 550,927
Int. Cl.[5] B66B *21/06*
U.S. Cl. 198—328 **6 Claims**



1. An escalator of the type having entry and exit zones, a medial inclined zone and upper and lower transition zones connecting said entry and exit zones to said inclined zone respectively, said entry, exit and inclined zones being rectilinear in elevation and said transition zones being curvilinear in elevation, said escalator comprising:

a. a series of steps having risers and treads meeting at step noses which are defined by a point in elevation, said steps traveling through said escalator zones along a first path of travel defined in elevation by a line connecting adjacent step nose points, said first path line being defined in elevation in said transition zones by a first radius; and

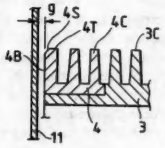
b. a pair of balustrades flanking said steps, said balustrades having upper edges defining a second path of travel along which handrails mounted on said balustrades move, said second path of travel being defined by a second path line in elevation, said second path line being defined in elevation in said transition zones by a second radius which is larger than said first radius and operable to maintain a substantially constant vertical distance between a central portion of the step treads and the handrail throughout the passenger-bearing path of travel of the escalator.

4,984,672

TREAD MEMBER FOR ESCALATOR OR TRAVELLING ROAD

Cyuichi Saito; Akio Ishida, both of Katsuta; Tatsuya Kaneko, Yokohama, and Toshihiko Kimura, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 19, 1989, Ser. No. 409,168
Claims priority, application Japan, Sep. 20, 1988, 63-233429
Int. Cl.[5] B66B *23/12*
U.S. Cl. 198—333 **37 Claims**



1. A member providing a tread surface, for a passenger conveyance apparatus, which member is one of an escalator step and a pallet of a travelling road, said tread surface having opposite lateral edges which in use of the member are closely spaced from skirt guards of the apparatus, said member at at least one of said lateral edges having a sloping surface extending inwardly and outwardly from the tread surface, said sloping surface thus in use being slopingly opposed to the skirt guard, a plurality of upstanding cleats extending in the travel direction of the member parallel to said lateral edges and including side-most cleats and intermediate cleats, each of aid cleats having top surfaces which provide said tread surface of the member, and said sloping surface being on a side-most one of said cleats and extending downwardly and outwardly from the top surface thereof at an angle relative to the skirt guards that is substantially larger than the corresponding angle of said intermediate cleats.

4,984,673

STEP OF PASSENGER CONVEYOR METHOD OF MANUFACTURING SAME, AND WAVY METAL PLATE

Chuichi Saito, Katsuta; Kazuhira Ojima, Kasama, and Yoshihiro Ohsumi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,814
Claims priority, application Japan, Mar. 7, 1988, 63-51498
Int. Cl.[5] B66B *23/12*
U.S. Cl. 198—333 **3 Claims**

1. A movable passenger conveyor comprising:

a plurality of step units arranged serially in a loop with adjacent step units pivotally interconnected about parallel axes to form the passenger conveyor;

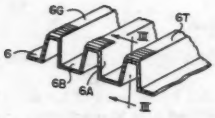
each of said step units being sheet steel folded with a plurality of parallel corrugations to produce top tread portions

extending generally coplanar for forming a tread, bottom recess portions, generally vertically extending wall portions and, bent edge portions connecting said wall portions to said tread portions and recess portions;

said tread portions and generally vertically extending wall portions forming a plurality of parallel cleats extending in a longitudinal direction transverse to said axes;

means forming a wear resistant surface on said tread, including an outer work-hardened upwardly facing metal surface between said edge portions;

said means including a plurality of parallel grooves deformed into the top surface of said sheet steel of said tread portions;



each of said grooves extending generally transverse to said longitudinal direction; and

a plurality of parallel grooves deformed into the bottom surface of said sheet steel of said tread portions in alternating relationship with said grooves deformed into the top surface to thereby corrugate each of said top tread portions in a direction perpendicular to said longitudinal direction so that the overall thickness of each tread portion is substantially greater than the thickness of the remainder of said sheet steel so that said means further increases the bending strength of the tread portions in the direction perpendicular to said longitudinal direction.

4,984,674

TIPPING APPARATUS AND METHOD FOR TILTING CARRIER CONVEYOR

John D. Fortenberry, 644 Pressley Rd., Charlotte, N.C. 28210

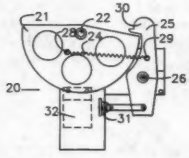
PCT No. PCT/US88/03927, § 371 Date Feb. 26, 1990, § 102(e) Date Feb. 26, 1990, PCT Pub. No. WO89/04285, PCT Pub. Date May 18, 1989

PCT Filed Nov. 4, 1988, Ser. No. 487,983

Claims priority, application Australia, Nov. 6, 1987, PI5274

Int. Cl.[5] B65G *37/00*

U.S. Cl. 198—365 **27 Claims**



1. A tipping apparatus for a tilting carrier conveyor having an elongate track and a plurality of carriers movable along the track, the tipping apparatus comprising:

carrier tipping means mounted for rotation about an axis adjacent to the track and between first and second rotational positions, said first rotational position being such that said tipping means is withdrawn from contact with any carrier passing thereadjacent and said second rotational position being such that said tipping means is disposed for engagement by any carrier passing thereadjacent, said tipping means for controllably engaging and tilting carriers as the same move along the track,

biasing means operatively connected with said tipping means for biasing said tipping means towards said second rotational position, and

controllably releasable means engaging said tipping means for controllably restraining said tipping means against rotation from said first rotational position toward said second rotational position.

4,984,675

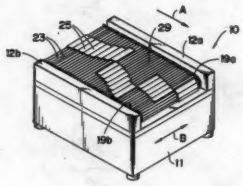
ARTICLE SORTING DEVICE

Keiji Yamabe, and Masao Yoshinaga, both of Ohtemachi, Japan, assignors to Nihon Cement Co., Ltd., Japan

Filed Sep. 27, 1989, Ser. No. 413,469

Int. Cl.[5] B65G *47/46*

U.S. Cl. 198—365 **4 Claims**



1. An article sorting device comprising: a pair of endless chains disposed facing each other and constructed so as to be driven to rotate and move in a first direction; a plurality of article conveying boards; sorting pins fixed to a bottom surface of each of said plurality of article conveying boards each of said plurality of article conveying boards being interlocked with said endless chains under a condition free to slide in a direction perpendicular to said first direction; a pair of sorting gates, for leading the ensuing sorting pins in a predetermined direction by interrupting a moving path of the sorting pins, said pair of sorting gates being fixed respectively to a pair of moving shafts arranged facing each other, said pair of moving shafts being positioned to each be movable horizontally inwardly and horizontally outwardly along the same straight line between an inwardly moved position and a retracted position, upon horizontal inward motion of one of said moving shafts, the sorting gate, fixed to the moving shaft, is moved horizontally from a retracted position to an inwardly moved position, interrupting the moving path of said sorting pin, each of said moving shafts at the inwardly moved position functioning as a stopper member to obstruct the inward motion of the other said pair of moving shafts that is at the retracted position.

4,984,676

DIRECT TRANSFER SORTING SYSTEM

Thomas J. Michel, Oakland Park, Fla., assignor to G B Instruments, Inc., Hollywood, Fla.

Continuation of Ser. No. 112,451, Oct. 26, 1987, Pat. No. 4,895,242. This application Nov. 2, 1989, Ser. No. 430,641

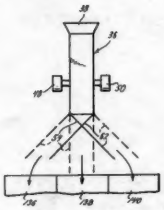
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.

Int. Cl.[5] B65G *47/46*

U.S. Cl. 198—365 **9 Claims**

1. Apparatus for sorting articles into a selected one of a multiplicity of article-receiving receptacles, said apparatus comprising a plurality of carriers, means for conveying said carriers together with said articles received therein along a predetermined path, each of said carriers having a carrier body defining a space for receiving and holding one or more of said articles as said carrier is conveyed along said path, a loading station along said path at which articles to be sorted are loaded into said carriers, a plurality of unloading stations along said path, each said unloading station having a group of said receptacles associated therewith, said carriers being selectively operable to effect the transfer of said articles carried thereby to

a predetermined one of said receptacles constituting said group of receptacles associated with a selected one of said unloading stations, each of said carriers having a pair of independently movable gates carried by said carrier body, each gate having a first position such that with both of said gates in their said first positions said gates cooperate with one another to hold the articles within said carrier, each of said gates having a respective second position such that with one of said gates in its said first position and with the other of said gates in its second position said articles carried by said carrier are released from said carrier and are guided to a first one receptacle of said group of receptacles at said pre-determined one unloading station and such with said one gate in its second position and with said other gate in its first position said articles carried by



said carrier are guided to a second receptacle of said group of receptacles at said pre-determined one unloading station, and each of said gates further having a third position such that with both of said gates in their respective said third positions said articles carried by said carrier are directed to a third receptacle of said group of receptacles at said predetermined unloading station, and selectively actuable means along said path for effecting movement of one or both of said gates of selected carrier to their stated respective second or third positions with said selected carrier in register with said one predetermined unloading station thereby to effect the transfer of said articles carried by said selected carrier to either said first, second, or third receptacles of said group of receptacles at said predetermined one unloading station.

4,984,677

DEVICE FOR TRANSFERRING OBJECTS FROM A CONVEYOR TO A COLLECTION DEVICE

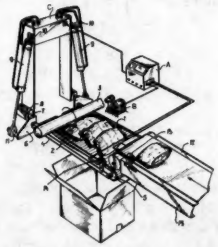
Bouwe Prakken, Spijkerlaan 9, 3471 Eg Kamerik, Netherlands

Filed Jan. 16, 1990, Ser. No. 465,954

Claims priority, application Netherlands, Jan. 31, 1989, 8900234

Int. Cl.[5] B65G *47/30*; B65B *5/10, 35/44, 57/14*

U.S. Cl. 198—418.6 **4 Claims**



1. In a device for transferring objects, comprising a conveyor comprised of two conveyor belts disposed next to each other and having a conveying position in which said two conveyor belts form one conveyor face, tiltable frames on which said conveyor belts are disposed, and means for tilting said frames from an object-supporting position in which said conveyor belts are disposed in said conveying position and a position in which objects fall from said conveyor belts; the improvement comprising a driven pulley adapted to contact upper surfaces of said belts in said conveying position to drive said belts, and drive means for rotating said pulley.

4,984,678

DEVICE FOR THE SEPARATION AND ALIGNMENT OF OBJECTS AND A SORTING INSTALLATION FOR USING SAME

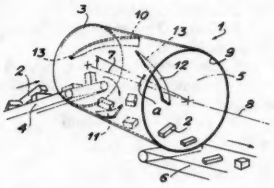
Pierre Fauchard, Nantes, France, assignor to Centre National d'Etudes des Telecommunications, Issy-les-Moulineaux, France

Filed Feb. 13, 1990, Ser. No. 479,248

Claims priority, application France, Feb. 15, 1989, 89 01981

Int. Cl.[5] B65G *47/12*

U.S. Cl. 198—443 **14 Claims**



1. A device for the separation and alignment of objects of the packages, parcels or similar kind, including conveyor means for the parcels brought in bulk to the inlet and for discharging the same parcels separated and aligned at the outlet, characterized in that it includes at least one truncated cone opened at its ends, driven continuously in rotation about its axis which is inclined with respect to the horizontal and which includes in its inner surface a set of helical wings, axially offset with respect to one another and extending when taken together over at least one complete turn of the truncated cone, the parcels introduced at the upper end of smaller diameter at the inlet of the truncated cone being discharged at its lower end of larger diameter at its outlet.

4,984,679

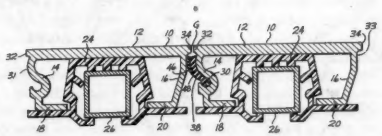
SEAL BETWEEN RECIPROCATING CONVEYOR FLOOR MEMBERS

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97441

Filed Mar. 23, 1990, Ser. No. 498,025

Int. Cl.[5] B65G *25/04*

U.S. Cl. 198—750 **6 Claims**



1. In a reciprocating floor conveyor composed of side-by-side floor members, each having a top and first and second downwardly depending opposite sides, with the first side of a first floor member closely confronting the second side of an adjacent second floor member and forming therewith a gap between said floor members, and an elongated seal strip within said gap having a base portion connected to the first side of the first floor member and an outboard portion in the gap and

contacting the second side of the second floor member, an improved seal, comprising:

said outboard portion including a first layer of plastic material which is in contact with the second side of the second floor slat member, said first layer being relatively hard and having a relatively low coefficient of friction;

a second backing layer secured to the first layer, said backing layer being constructed of a relatively resilient material;

said first and second layers together giving the outboard portion a thickness that is greater than the width of the gap;

said second layer being sufficiently resilient that it will compress an amount sufficient to allow the outboard portion to fit into the gap without exerting a drag force between the slat members of a size to interfere with free longitudinal movement of the slat members; and

said seal strip lip substantially always filling the gap between the two floor members.

4,984,680

ARTICLE TRANSFER APPARATUS WITH CLAMPER

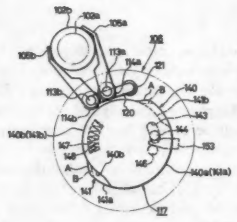
Itirou Hamano, Ishikawa, Japan, assignor to Shibuya Kogyo Co., Ltd., Ishikawa, Japan

Filed Jun. 20, 1989, Ser. No. 368,600

Claims priority, application Japan, Oct. 26, 1988, 63-270378; Nov. 30, 1988, 63-302598

Int. Cl.[5] B65G *47/86*

U.S. Cl. 198—803.9 **9 Claims**



1. An article transfer apparatus with clamper including a frame, a rotatable body which is rotatably mounted on the frame, a pair of clamp shafts rotatably mounted on he rotatable body for rotation in opposite directions from each other, said clamp shafts being carried along a path of travel by said rotatable body, a pair of clamp arms mounted on respective clamp shafts for swinging motion, clamp arm swing means for causing a swinging motion of the clamp arms, the arrangement being such that a vessel grasped by the pair of clamp arms may be transferred as the rotatable body rotates; wherein the clamp arm swing means includes a cam mechanism which comprises a rocking lever mechanically coupled with the clamp shafts, a cam follower mounted on the rocking lever, and a cam member mounted on the frame, the cam follower being disposed for engagement with a cam surface on the cam member to cause a rocking motion of the rocking lever in accordance with a cam profile to cause a rotation of the clamp shafts to drive the pair of clamp arms for swinging motion, further including an adjusting mechanism for causing said swinging motion of the pair of clamp arms to occur only at selected locations on said path of travel, said clamp arms including means defining a pair of opposed V-shaped surfaces for holding a circular vessel positioned therebetween such that the geometric center of the vessel is, regardless of the diameter thereof, coincident with a point of intersection of respective bisectors of said V-shaped surfaces, said clamp arms defining an opening angle therebetween for receiving the circular vessel, the location of said bisector intersection point being dependent on said opening angle, the size of said opening angle and the corresponding location of said bisector intersection point varying with said swinging motion of said clamp arms to permit holding circular vessels of various diameters, said opening angle having a critical value at which said bisector intersection point is closest to said clamp shafts, said bisector intersection point being further from said clamp shafts at all other operative values of said opening angle whether greater or less than said critical value.

4,984,681

BELT CONVEYOR WITH BELT PARTS CARRIED BY A GAS

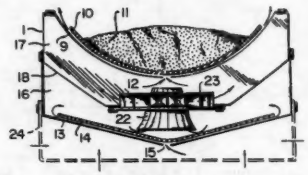
Cornelius O. Jonkers, Zwaluwenweg 26, 1261 CJ Blaricum, Netherlands

Filed Mar. 28, 1989, Ser. No. 329,845

Claims priority, application Netherlands, Mar. 28, 1988, 8800782

Int. Cl.[5] B65G *15/60*

U.S. Cl. 198—811 **5 Claims**



1. A belt conveyor having a frame which comprises a gas cabinet, the belt conveyor further including an endless belt having a load-conveying run and a return run, each of which travels over a respective trough bottom, said trough bottoms forming parts of said gas cabinet and each being provided with apertures, compressor means for causing a gas to pass through the apertures in the trough bottoms to respective positions underneath said belt runs, said gas cabinet having a partition above the belt return run and under the trough bottom for the belt load-conveying run, in order to divide the cabinet into two separate gas chambers, wherein the compressor means includes a compressor which is connected to the bottom gas chamber and which draws in gas from the environment to cause the passage of the gas through the apertures in the trough bottom for the belt return run, said apertures in the trough bottom for the belt return are distributed in an essentially regular pattern over the entire length of the conveyor, the number of these apertures is a least 2 and at most 40 per meter of belt length, the joint surface area of these apertures is at least 1.5 cm^2 and at most 20 cm^2 per m^2 of belt surface area, an enclosure is provided under the trough bottom for the belt return run and has peripheral edges connected to the trough bottom, and at least one wall of the enclosure includes a filter for the inflowing gas.

4,984,682

EYEGLASS HOLDER

Susan Cummins, 12 Canal Run West, Washington Crossing, Pa. 18977

Filed Jan. 18, 1990, Ser. No. 466,767

Int. Cl.[5] H45G *11/04*

U.S. Cl. 206—5 **16 Claims**

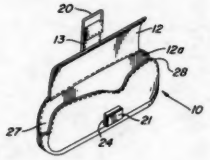
1. A single fastener glass case comprising:

(a) a horizontally oriented contoured receptacle having a front and rear section and an outer skin and inner lining for receiving a pair of eye glasses within a frame including temple pieces;

(b) a firm protective member positioned in said front section intermediate said skin and lining for safeguarding the optical members of said glasses;

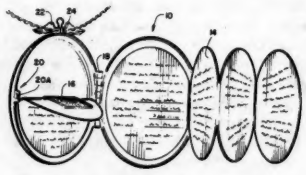
(c) a first clasp member attached to said receptacle;

(d) a rectangular back flap means extending from the vicinity of said upper front section of said receptacle;
(e) a strap means positioned in juxtaposition to said flap means;
(f) a second clasp member attached to the end of said strap means; and



(g) said flap means of said single fastener case being foldable over said frames and temple pieces when said strap means is brought into position to allow mating of said first and second clasp members.

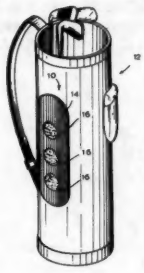
4,984,683
FINE JEWELRY ENCLOSING WEARER IDENTIFICATION AND MEDICAL INFORMATION THEREIN
Audrey L. Eller, 221 Loma Corta Dr., Solana Beach, Calif. 92075
Filed Mar. 16, 1990, Ser. No. 494,439
Int. Cl.[5] B65D *85/67*; A44C *15/00*
U.S. Cl. 206—38 **16 Claims**



1. Fashion jewelry enclosing wearer identification and medical information comprising:
a concealed compartment within said jewelry, said concealed compartment having at least two surfaces located therein;
a first sheet of waterproof paper with wearer identification thereon attached to one of said two surfaces;
a second sheet of waterproof paper with wearer medical history thereon attached to the other of said two surfaces; and
indicia symbolic of the medical profession carried by said jewelry in a prominent external location thereon.

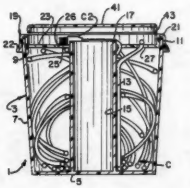
4,984,684
AWARD-DESIGNATION APPARATUS FOR A GOLF CLUB BAG AND THE LIKE
John A. Conner, and Dorothea H. Conner, both of 330 Clubhouse Ct., Coram, N.Y. 11727
Filed May 18, 1990, Ser. No. 524,874
Int. Cl.[5] A63B *55/00, 57/00*; A44C *3/00*
U.S. Cl. 206—315.3 **1 Claim**

1. Apparatus for the designation of an award on a golf bag, comprising:
a support comprising the outer surface of said bag;
a first surface having a first side and a second side, means permanently connecting said first side of said first surface to said support;
a second surface having a first side and a second side, said first side of said second surface being affixed to said second side of said first surface;
means for attaching said second surface to said first surface; and,



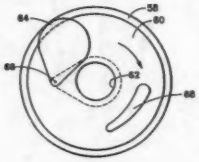
designation means, said designation means being located on said second side of said second surface.

4,984,685
PORTABLE CONTAINER FOR ELONGATED ELEMENTS
Frank A. Douglas, Rte. 2, Box 18, Hwy. B, Cedal Hill, Mo. 63016
Filed Jan. 2, 1990, Ser. No. 459,436
Int. Cl.[5] B65D *73/00*
U.S. Cl. 206—334 **17 Claims**



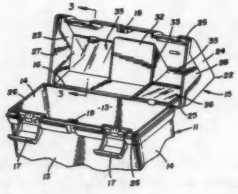
1. A portable electric extension cord container comprising:
a container having a bottom wall and a peripherally continuous sidewall extending upwardly from the bottom wall and terminating in an open upper end;
an inner shaft within said container which is attached to said bottom wall and which extends upwardly towards the open upper end of said container, said inner shaft being peripherally spaced from the sidewall to enable an electric extension cord to be wrapped around the inner shaft within the container; and
a lid covering the open upper end of said container said inner shaft having an outer end adjacent the plane of said lid, said lid having opening means overlying said inner shaft which is larger than said inner shaft and which cooperates with said inner shaft to enable an electric extension cord to be inserted into the container and wrapped about the inner shaft or removed from the container while being unwound from the inner shaft.

4,984,686
SHARPS CONTAINER CLOSURE AND NEEDLE EXTRACTOR ASSEMBLY
Richard A. Shillington, Leucadia, Calif., assignor to Med-Safe Systems, Inc., Carlsbad, Calif. and Becton, Dickinson and Company, Franklin Lakes, N.J.
Continuation-in-part of Ser. No. 298,590, Jan. 17, 1989, Pat. No. 4,844,245. This application Jan. 23, 1989, Ser. No. 299,936
Int. Cl.[5] B65D *83/10*
U.S. Cl. 206—366 10 Claims



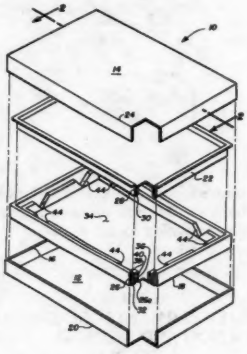
1. A disposable container closure assembly comprising:
closure frame means for mounting on an upwardly extending opening defining peripheral rim of a substantially rigid container;
an opening in said frame means for receiving a disposable article; and
needle removal slot means in said frame means adjacent said opening, said slot means comprising an elongated converging slot having semi-circular ends of different diameter and opposing side walls sloping inwardly from a top to a bottom surface thereof defining opposed wrench surfaces for engagement with a hub of a needle for applying torque thereto.

4,984,687
TOOLBOX WITH PEAKED ROOF
Thomas E. Hanna, and Keith E. Brightbill, both of Wooster, Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 26, 1990, Ser. No. 471,925
Int. Cl.[5] B65D *85/28*
U.S. Cl. 206—373 8 Claims



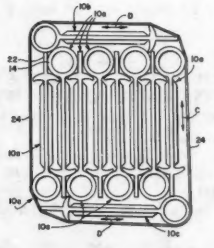
1. A toolbox or the like comprising a base for containing materials, a cover hingedly attached to said base, said cover including sidewalls extending upwardly from said base when said cover is closed on said base and a curvilinear portion spanning between said sidewalls of said cover and forming the top of said cover, a recessed grip area near the top of said cover, said grip area having sidewalls extending downwardly from the top of said cover, said cover including generally vertical end walls extending upwardly from said base when said cover is closed on said base, and closure means extending from said sidewalls of said cover below said curvilinear portion and defining with said curvilinear portion with said sidewalls and with said end walls a compartment on each side of said recessed grip area within said cover for containing materials therein.

4,984,688
FILM BOX
Joseph F. Mikulin, North Brunswick, N.J., assignor to E. I. Du Pont De Nemours & Co., Wilmington, Del.
Filed Jul. 14, 1989, Ser. No. 379,645
Int. Cl.[5] B65D *85/48*
U.S. Cl. 206—455 17 Claims



1. In a box adapted to hold actinic-sensitive film, said box including a container and a cover adapted to close over an opening in said container, the improvement comprising said container having a flexible tray element inserted within and adjoining an outer section of said container and said cover having a flexible cover element inserted within and adjoining an outer section of said cover, said tray element and said cover element having cooperative mating means disposed adjacent to the perimeter of said cover for tightly joining together respective flexible surface portions thereof when said cover closes over said opening, said mating means comprising a male member disposed in one of the tray or cover elements and a female member disposed in the other element, said outer sections of both said container and said cover being more rigid than said flexible elements.

4,984,689
PACKAGING SYSTEM FOR LANDSCAPING BED DIVIDERS
Seymour Emalfarb, and Bradley S. Emalfarb, both of 1585 Saunders, Riverwoods, Ill. 60015
Filed Nov. 8, 1989, Ser. No. 433,221
Int. Cl.[5] B65D *21/00*
U.S. Cl. 206—499 9 Claims



1. A system for packaging a plurality of sections of elongate bed dividers each having a top and a bottom, a width defined between the top and bottom, and a flange that is approximately

planar, each said flange having top and bottom ends and a lengthwise extent thereby defining at least a part of each bed divider section, said bed divider sections being embedded in the ground to form a boundary between adjacent landscaping areas, said system comprising:

a plurality of said bed divider sections arranged in an elongate stack of juxtaposed sections in which the planes of the flanges of the plurality of bed divider sections are in generally parallel relationship and overlapped with each other along the lengths of the bed divider sections to define a generally polygonal-sided stack viewed in cross section transverse to the length of the stack with a cross-sectional height taken at substantially a right angle to the planes of the flanges in the polygonal stack, the cross-sectional height of the stack being generally equal to the width of the bed divider sections;

another of said bed divider sections arranged lengthwise along at least one side of said polygonal stack in such a manner that the plane of its flange is generally perpendicular to the planes of the flanges of the plurality of bed divider sections in said polygonal stack; and

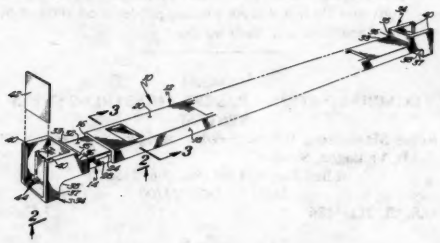
means for holding the plurality of bed divider sections in the polygonal stack and the another bed divider section in a discrete package whereby the stack of sections rigidify the package in one transverse direction and said another section rigidifies the package in an opposite, transverse direction.

4,984,690

FOOD CONTAINER STACKING DEVICE

Frederick M. King, Minneapolis, and Harry F. Collins, Minnetonka, both of Minn., assignors to Service Ideas, Inc., Minneapolis, Minn.

Filed Aug. 28, 1989, Ser. No. 398,945
Int. Cl.[5] B65D *85/62*; A47F *1/00*
U.S. Cl. 206—503 **6 Claims**



1. A food container stacking device, comprising:

a first elongate support element including first and second vertical walls, a first horizontal wall extending therebetween, and a first end structure on one end thereof;

a second elongate support element slidably engaged with said first support element, said second support element including a second horizontal wall extending in facing, parallel juxtaposition to said first horizontal wall, and a second end structure on one end thereof at the opposite end of the food container stacking device from said first end structure;

said second support element is contained within said first support element with said second horizontal wall disposed under said first horizontal wall;

said first support element includes means for retaining said second support element therein;

said second support element includes means for cooperative engagement with said means for retaining said second support element within said first support element;

said means for retaining said second support element within said first support element includes at least one shoulder extending inwardly from each of said first and second vertical walls of said first support element, said shoulders defining a slot between said shoulders and said first horizontal wall of said first support element; and

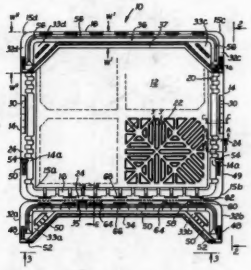
said second support element means for cooperative engagement with said means for retaining said second support element within said first support element includes at least one pair of outwardly extending peripheral projections on opposite sides of said second horizontal wall for cooperative, slidable engagement with said shoulders of said first support element.

4,984,691

CONTAINER

David L. Jones, Ruskington, England, assignor to Styropack (UK) Limited, Aberdeen, Scotland

Filed Oct. 31, 1989, Ser. No. 429,712
Int. Cl.[5] B65D *21/06, 43/16*
U.S. Cl. 206—506 **13 Claims**



1. A container comprising a body having a base, two pairs of opposed side walls extending upwardly from the base to define a corner between adjacent side walls, four support members, each support member being disposed at a respective corner, the support members being selectively movable between a first position in which a further container can be nested inside the body, and a second position in which the support members can support the further container above the base, wherein a first pair of said support members is connected together by a first connecting member provided therebetween, and a second pair of said support members is connected together by a second connecting member provided therebetween, and a strengthening formation is provided which extends substantially continuously over each support member and along the respective connecting member to which each support member is connected, each strengthening formation engaging the inner surface of said side walls when the support members are in the second position.

4,984,692

OPTICAL CHARACTER READING APPARATUS WITH SORTER

Tadashi Obara, Hamura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

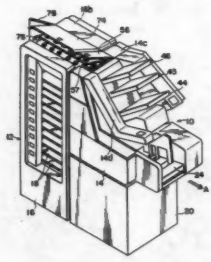
Filed Jul. 19, 1989, Ser. No. 381,861
Claims priority, application Japan, Jul. 19, 1988, 63-179684
Int. Cl.[5] B07C *5/36*; B65H *39/11*
U.S. Cl. 209—583 **14 Claims**

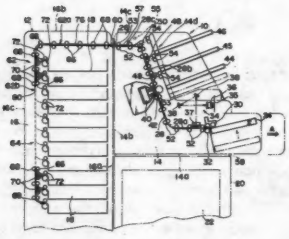
1. An optical character reading apparatus comprising:

a scanner section including a first housing, and reading means arranged in the first housing, for reading characters from objects to be scanned, said first housing having a rear wall and a discharge port at and upper end portion of the rear wall through which objects read by the reading means are discharged from the first housing;

a sorter section including a second housing, a plurality of

receiving portions in the second housing, a transfer path inside the second housing for guiding the objects discharged from the scanner section to the receiving portions, and means for distributing each discharged object from the scanner section to a desired one of the receiving portions, said second housing having a rear wall adjacently facing the rear wall of the first housing, a front wall, a top wall, and a supply port through which the objects discharged through the discharge port are introduced into the second housing, said supply port facing the discharge port of the first housing, said transfer path including a first passage extending from the supply port to the region near the front wall of the second housing, along the top wall of the second housing, and a second passage





extending downward from the region near the top wall of the second housing, along the front wall of the second housing, so as to be continuous with the first passage, said receiving portions being arranged along the second passage;

said sorter section including an auxiliary housing having a rear wall adjacently facing the rear wall of the second housing and a top wall extending in a direction substantially perpendicular to the rear wall, said first housing of said scanner section having a bottom wall opposed to the top wall of the auxiliary housing; and

a slide mechanism arranged on the top wall of the auxiliary housing and supporting the scanner section to be slidable relative to the rear wall of the auxiliary housing.

4,984,693

PRODUCT DISPLAY SHELF

Paul Belokin, Jr., and Martin Belokin, both of Denton, Tex., assignors to Martin Paul, Inc., Denton, Tex.

Filed Jul. 20, 1990, Ser. No. 556,325
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—88 **11 Claims**

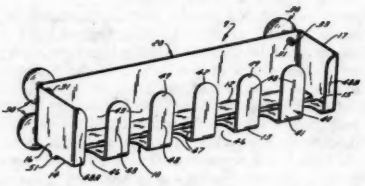
1. A product display shelf for a point-of-sale cabinet of the type that includes a transparent door panel having an inside surface, interior shelf elements and an unused space between said inside of said door panel and said interior shelf elements, said display shelf being detachably mountable on said inside surface of said door in said unused space comprising:

a horizontal shelf means for supporting products and having spaced apart inner, outer and end edges;

a back wall means mounted to extend in a generally vertical direction relative to said inner edge;

a suction type attachment means mounted on said back wall means to enable said shelf when in use to be detachably secured to said inside surface of said door panel;

a product retainer means extending substantially vertically from said shelf means outer edge in spaced relation to said back wall means and having an upper margin;



a plurality of vertical access openings in said retainer means spaced in close proximity to each other;

said vertical access openings extending between said upper margin and said outer edge;

a plurality of horizontal access openings in said horizontal shelf means spaced in close proximity to each other, said horizontal access openings extending between said outer edge and said back wall inner edge; and

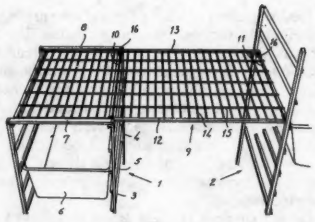
said vertical and horizontal access openings dimensioned to provide an access space through which fingers may be conveniently inserted for placing products on and removing them from said shelf means.

4,984,694

COMBINED STRING BASKET AND STRING SHELF SYSTEM

Reine Magnusson, Bålsta, Sweden, assignor to Sparring Elfa AB, Vallingby, Sweden

Filed Jan. 4, 1989, Ser. No. 293,331
Int. Cl.[5] A47F *43/00*
U.S. Cl. 211—186 **7 Claims**



1. A combined string basket and shelf system comprising:

a first and second connecting means (1, 2) longitudinally spaceable from each other at any overall selected distance, at least one said connecting means comprising a string basket stand having front and rear portions and including spaced apart front and rear stand tubes (3, 4) interconnected by one or more slide bars (5, 10, 11) that extend horizontally therebetween to provide an inside area having a longitudinal width, a support unit having projecting

frame portions, said slide bars receiving said projecting frame portions of said support unit (6) and being mountable in said inside area;

one or more connection and stabilization means (9) for interconnecting said first and second connecting means, each of said connection and stabilization means including a longitudinally extending string shelf (9) having a plurality of cross strings (14) extending front to rear and spaced apart from each other along said longitudinal extent thereof, said string shelf being free to be moved in longitudinal directions relative to said connection and stabilization means to extend into said inside area for a variable distance that will result in said connection and stabilization means and and string shelf having a combined overall longitudinal width that will bridge said selected distance;

clip means (16) mounted on one or more of said slide bars for releasably receiving and holding that one of said plurality of cross strings which is in alignment therewith after said string shelf has been positioned to bridge said selected distance at which said first and second connecting means are spaced apart ; and

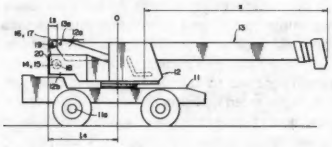
said clip means when in an installed condition holding said one cross string to prevent any further movement between said string shelf and said first and second connecting means in either of said longitudinal directions to stabilize said system at any overall width bridging said selected distance.

4,984,695

WHEEL CRANE

Hideki Goto, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 14, 1989, Ser. No. 407,281
Int. Cl.[5] B66C *23/04*
U.S. Cl. 212—231 **3 Claims**



1. A wheel crane, comprising:

a lower running body having a front and rear end,

an upper pivotal body pivotally mounted on said lower running body and having a front end and a rear end,

a cabin mounted on said upper pivotal body for use in operating and travelling said wheel crane;

a boom having a base end mounted for up and down pivotal motion around a boom foot pin on said upper pivotal body and being telescopically extensible at a front end thereof opposite a rear end thereof, at least two winch drums disposed at a rear location of said pivotal body, and at least two guide sheaves disposed at another rear location of said pivotal body for guiding ropes drawn out from said winch drums individually to a rear face side of said rear end of said boom via the base end of said boom,

said boom foot pin being mounted at an end portion of said base end of said boom on the rear face side of said boom, and adjacent an upper side of said boom,

said boom foot pin being mounted at a location of said upper pivotal body rearwardly of the center of a rear axle of said lower running body,

said at least two guide sheaves and said at least two winch drums being respectively mounted in a left and right juxtaposed relationship at locations of said upper pivotal body nearest to the base end of said boom within a range wherein said guide sheaves and winch drums are not contacted with the base end of said boom when said boom is pivoted upwardly, wherein said guide sheaves are substantially horizontally aligned with said boom foot pin, and

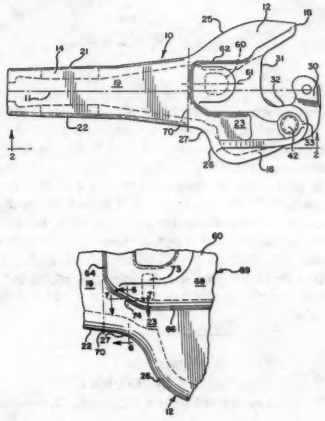
the locations of rear ends of said at least two guide sheaves being substantially coincident to the position of the rear end of said upper pivotal body in forward and backward directions.

4,984,696

RAILWAY COUPLER HEAD STRENGTHENED AT HORN LINE

Russell G. Altherr, Munster, Ind., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Dec. 11, 1989, Ser. No. 448,370
Int. Cl.[5] B61G *3/00*
U.S. Cl. 213—151 **2 Claims**



1. An improved coupler head for use in joining adjacent railway vehicles, said coupler head of the type having a guard arm side and a knuckle side, and a lock chamber projecting upwardly from a top face thereon with a guard arm side wall, a knuckle side wall parallel to said guard arm side wall, and a rear horn wall perpendicular to said guard arm side wall and said knuckle side wall, the improvement in which:

said lock chamber is asymmetrical with respect to its longitudinal center line such that said rear horn wall has a greater length on said guard arm side of said longitudinal center line than said knuckle side of said longitudinal center line and said knuckle side wall of said lock chamber has a shorter length than said guard arm side wall of said lock chamber;

said rear horn wall is joined to said knuckle side wall on said knuckle side of said longitudinal center line by a connecting section, said connecting section being located inwardly of said rear horn wall and said knuckle side wall with respect to said lock chamber.

4,984,697

LEAKAGE PREVENTING BABY BOTTLE

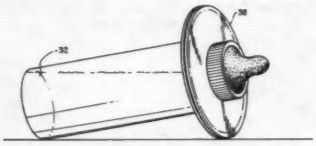
Donna Kelly, 4 Bugle Ct., Howell, N.J. 07731

Filed Jan. 11, 1990, Ser. No. 463,537
Int. Cl.[5] A61J *9/00, 9/06*
U.S. Cl. 215—11.1 **3 Claims**

1. The combination comprising:

a baby bottle having an open neck portion and also having a body portion of given width;

a cap having a predetermined width and with a nipple closing off said neck portion;
and a collar surrounding said bottle adjacent said neck portion;
with said collar being secured in place against said neck portion by said cap;
with said collar having an outer dimension greater than the width of said body portion;
wherein said baby bottle has a body portion of given diameter and wherein said collar is of a generally annular configuration having an outer diameter greater than the diameter of the body portion;



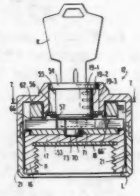
wherein said baby bottle has a neck portion of given diameter and wherein such collar also has an inner diameter greater than the diameter of said neck portion;
wherein the inner diameter of said collar is less than the diameter of said body portion;
wherein said collar is composed of a pair of overlying annular discs, each having upper and lower surfaces;
wherein an outer circumferential edge of at least one of the lower surface of said top-most disc and the upper surface of said bottom-most disc is luminescent; and
wherein except for said circumferential edge, each of said pair of overlying discs are composed of a see-through material.

4,984,698

LOCKABLE CLOSURE CAP

William C. Stuckey, 1503 Virginia St., East, Charleston, W. Va. 25311

Continuation-in-part of Ser. No. 148,468, Jan. 26, 1988, Pat. No. 4,796,768. This application Dec. 12, 1988, Ser. No. 283,093
Int. Cl.[5] B65D *55/14*
U.S. Cl. 215—207 **15 Claims**



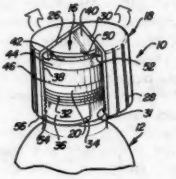
1. In a lockable closure cap assembly including a closure cap having a threaded bore for threadable engagement with the threads of a container neck, an annular shell surrounding said closure cap, and a mechanism for selectively engaging and disengaging said closure cap with scid annular shell to permit rotation of said closure cap with said annular shell and free rotation of said annular shell with respect to said closure cap, respectively, said mechanism including at least one projection on said closure cap, a lock assembly mounted in a bore in said annular shell, said lock assembly having a cam operating member, said closure cap having an upper surface, the improvement comprising a clutch shoe carrier rotatably nested on said upper surface of said closure cap, at least one clutch shoe slidably mounted in said clutch shoe carrier, an arcuate cam surface formed in at least one said clutch shoe and operatively engaged with said cam operating member so that said clutch shoe is moved to and from engagement with said at least one projection on said closure cap solely by rotation of said cam.

4,984,699

TAMPER EVIDENT CAP

Gregory J. Zalut, 24640 Laetham, East Detroit, Mich. 48021

Continuation-in-part of Ser. No. 201,329, May 27, 1989, Pat. No. 4,874,101. This application Jul. 18, 1989, Ser. No. 381,206
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—231 **14 Claims**



1. A container and cover combination (10) comprising: a container (12) including a neck portion (20) defining an opening (22) into said container (12); removeable cover means (16) fastened onto said neck portion (20) for covering said opening (22); said cover means including tamper evident means for indicating an attempted opening of said cover means, characterized by said tamper evident means including a substantially cup-shaped cap member (18) having a base portion (26) and an annular flange portion (28) thereabout and a fractureable portion (30) and one way threading means for locking said cap member (18) against unthreading from said neck portion (20) when said cap member (18) is rotated in one direction relative to said neck portion (20) and for forcing said cap member (18) further into said neck portion (20) to fracture said fractureable portion (30) when said cap member (18) is rotated in the opposite direction relative to said neck portion (20) thereby evidencing the attempted opening.

10. A method of assembling a container and closure combination including the steps of: screwing a tamper evident cap member (18) having a fractureable portion (30) onto a neck portion (20) of a container (12); and locking the cap member (18) on a one way thread (34) against unthreading from the neck portion (20) when the cap member (18) is turned in one direction relative to the neck portion (20) while allowing the cap member (18) to be threaded further onto a one way thread (34) to force the cap member (18) further onto the neck portion (20) to fracture the fractureable portion (30) when the cap member (18) is rotated in the opposite direction relative to the neck portion (20).

4,984,700

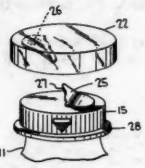
TAMPER INDICATING CLOSURE ASSEMBLY

Michael G. Knickerbocker, Upland, Calif., assignor to Calmar, Inc., Watchung, N.J.

Filed Nov. 17, 1989, Ser. No. 437,592
Int. Cl.[5] B65D *51/18*
U.S. Cl. 215—251 **5 Claims**

1. In a linerless tamper indication closure assembly comprising, in combination, a closure cap for a container comprising a uniplanar circular end wall for disposition entirely above the neck of a container and a depending cylindrical skirt for telescoping reception of the container neck, cooperating nonbondable means on the skirt and the container neck for removable engagement of the cap with the container, a removable overcap having a uniplanar circular end wall overlying said closure cap end wall, and said overcap having a depending circular skirt surrounding said cap skirt coupled to the con-

tainer neck and without being coupled to said closure cap, said overcap having a transparent window, a rupturable sheet disposed between said closure cap and said overcap and being exposed through said window, first means bonding said sheet to said closure cap and second means bonding said sheet to said



overcap, whereby said sheet is caused to rupture upon lifting off said overcap from said closure cap, as well as upon turning said overcap in either direction relative to said closure cap, thereby evidencing tampering before removal of said closure cap from said container neck.

4,984,701

TAMPER-EVIDENT CLOSURE

Mario Margaria, Asti, Italy, assignor to Alplast S.p.A., Tigliole D'Asti, Italy

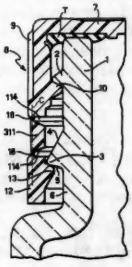
PCT No. PCT/EP87/00539, § 371 Date Mar. 22, 1989, § 102(e) Date Mar. 22, 1989, PCT Pub. No. WO88/02340, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 22, 1987, Ser. No. 336,355

Claims priority, application Italy, Sep. 24, 1986, 53868/86[U]; Sep. 16, 1987, 53650/87[U]

Int. Cl.[5] B65D *41/34*

U.S. Cl. 215—256 **4 Claims**



1. A tamper-evident closure for use in connection with a rigid container including a threaded neck portion and an annular rib below said threaded neck portion, said closure comprising a one piece plastic capsule including a flat top wall and a cylindrical skirt having a longitudinal axis, the inner surface of said flat top wall including sealing means cooperating with the upper end of the container neck portion and said cylindrical skirt including an internally threaded upper portion, an intermediate portion comprised between two circumferential weakening zones which, in a cross-section, are aligned on a vertical line which is parallel to said longitudinal axis of the cylindrical skirt, said intermediate portion forming a tearable opening band having a gripping portion, and a lower portion including an inwardly projecting annular engagement rib which snap engages below said annular rib of the container neck as a result of the first screwing on of the capsule, characterized in that the capsule is made of a synthetic resin having a hardness greater than 75 Shore D and the tearable opening band extends, at least in part, inwardly of the cylindrical skirt of the capsule relative to the vertical line which joins the two weakened zones which connect said band to the skirt.

4,984,702

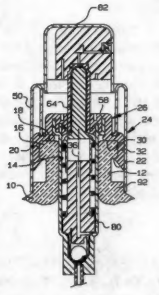
ASSEMBLY FOR SECURING AND SEALING A DISPENSER TO A FLANGED CONTAINER

Robert Pierpont, Meriden, Conn., assignor to Specialty Packaging Licensing Company, Inc., Wilmington, Del.

Filed Mar. 30, 1990, Ser. No. 501,853

Int. Cl.[5] B65D *47/00*

U.S. Cl. 215—272 **4 Claims**



1. In a container assembly comprising:

(1) a container having a neck with an opening for dispensing product, the neck having a flange including an upper surface surrounding the opening and a cylindrical sidewall about its periphery, said sidewall of said flange having a diameter and said neck including an inwardly directed ledge at the bottom thereof, the sidewall having a length which may vary within manufacturing tolerances,

(2) a mounting sleeve comprising a substantially rigid material, said sleeve having an outer tube around its periphery, said sleeve slideable through a path of movement over said container flange to an assembled position, and

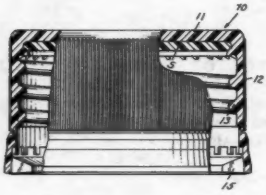
(3) a sealing collar comprising a resilient deformable molded polymeric material, said collar having a central opening for receiving said dispenser, said collar including a generally cylindrical protrusion having a diameter sized to receive said flange sidewall and sized to be encased by said mounting sleeve outer tube, at least a portion of said protrusion when collapsed having an inner diameter less than said diameter of said flange sidewall to provide an annular area of contact between the protrusion and the flange sidewall in a snug, frictional fit therebetween, said protrusion including a plurality of fingers having enlargements at the bottom thereof and a camming surface protruding in said path of movement of said mounting sleeve for collapsing said protrusion, said enlargements deforming radially inwardly under said ledge, as said protrusion collapses, the improvement wherein the mounting sleeve is formed at its upper end with a reentrant inner tubular run and an inward annular engagement flange is provided at the lower end of the inward tubular run, and the top surface of the collar is formed with a central boss, the sleeve in assembly having the annular engagement flange frictionally engaging against the central boss.

4,984,703

PLASTIC CLOSURE WITH COMPRESSION MOLDED SEALING LINER

Dennis J. Burzynski, Toledo, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Oct. 3, 1989, Ser. No. 416,620
Int. Cl.[5] B65D *53/00*
U.S. Cl. 215—350 7 Claims



1. A plastic closure comprising

a base wall, a peripheral skirt, means on said skirt adapted to attach the closure to a container, and

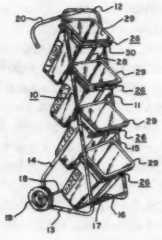
a sealing liner compression molded in situ on the interior of the base wall of the closure, said sealing liner comprising a blend of an ethylene vinyl acetate composition and a thermoplastic elastomeric composition, said ethylene vinyl acetate composition comprises at least 70% of the liner composition, said closure operating satisfactorily on both plastic and glass containers.

4,984,704

TRASH CONTAINER SUPPORTING APPARATUS

James O'Malley, 110 DuBois Rd., Glassboro, N.J. 08028

Filed Aug. 18, 1989, Ser. No. 395,542
Int. Cl.[5] B65D *25/22*
U.S. Cl. 220—23.4 4 Claims



1. Trash container supporting apparatus for a plurality of trash containers permitting separation of different categories of trash for recycling purposes comprising:

a trash container frame;

a plurality of trash container supports each pivotally interconnected to the trash container frame and each adapted to support a trash container;

an equal number of trash containers positioned within each trash container support and extending below their respective support and;

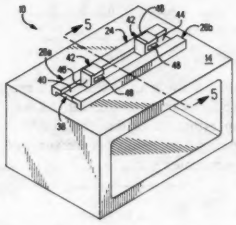
a lower cross support at the lower extremity of the trash container frame against which the lowermost trash container engages when the trash container supporting apparatus is in the vertical position to maintain the trash container and those thereabove in an inclined position, whereby the trash container frame and included trash containers may be positioned between a generally vertical position for conservation of space and a generally horizontal position while the trash containers remain in a generally vertical position.

4,984,705

MOUNTING FIXTURE FOR ELECTRICAL JUNCTION BOXES

Jerome V. Assal, Glenside, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 3, 1990, Ser. No. 518,636
Int. Cl.[5] H02G *3/08*
U.S. Cl. 220—3.9 1 Claim



1. A mounting fixture and mounting inserts for use on an electrical junction box, comprising:

a mounting fixture comprising a pair of spaced apart, L-shaped strips on one surface of an electrical junction box with a first leg being normal to and extending away from said one surface and a second leg being parallel to and spaced from said one surface and having a free end facing a free end on the other second leg, said strips defining in cooperation with each other a space therebetween; and

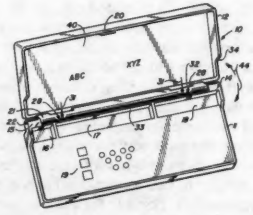
a mounting insert having a plate slidably received is said space between said L-shaped strips and retained therein by said second legs and an attachment device on said plate and extending outwardly to attachment means in an electrical raceway, said device comprising a pair of spaced apart pillars with each having a slot opening out in the same direction and parallel to said plate.

4,984,706

HINGED CASING

Peter F. Cadwell, Sunnyvale, and Noah L. Anglin, San Jose, both of Calif., assignors to Poqet Computer Corporation, Sunnyvale, Calif.

Filed Jun. 30, 1989, Ser. No. 373,769
Int. Cl.[5] E05D *11/00*
U.S. Cl. 220—334 16 Claims



1. A two-piece hinged container comprising:

a lower housing having at least one hinge element and a rear side wall containing at least one elongated slot on an exterior surface thereof;

a upper housing having at least one hinge element operable

mounted with and pivotable with respect to said at least one hinge element of said lower housing rear side wall, and a rear side wall having a longitudinal exterior transversely curved surface juxtaposed with respect to said elongated slot of said lower housing; and

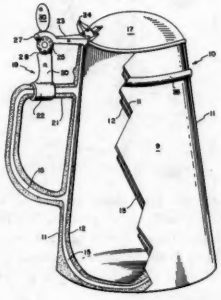
at least one elongated leaf spring having end portions captured in a respective ones of said at least one slot in said lower housing and having a central portion extending outwardly from said lower housing side wall tangent to and in friction engagement with said upper housing exterior transversely curved surface with sufficient spring force such that said upper housing and lower housing may be rotated with respect to one another about said hinge elements so as to fixedly position said housing together by friction forces in an infinite number of angular positions with respect to each other.

4,984,707

THERMALLY INSULATED BEVERAGE MUG

Frederick Fierthaler, Perch Pond Rd. R.D. #1, Box 133, Nineveh, N.Y. 13813

Filed Jul. 25, 1989, Ser. No. 384,535
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—412 **8 Claims**



1. A thermally insulated beverage mug, comprising:

a frustro-conical vessel having a hollow chamber for receiving and dispensing liquids, said chamber defined by an inner wall, an outside of said vessel defined by an outer wall, said frustro-conical vessel having a mouth portion defined by a circular rim and having means defining a hollow section disposed between said inner and outer walls for retarding heat conductivity between said inner and outer walls, said hollow section being disposed substantially throughout a body section and a handle section;

means defining a circumferential rim disposed on said outer wall of said vessel, below said mouth portion;

said handle section connected to said body section of frustro-conical vessel for lifting said vessel;

a domed lid disposed over said mouth portion of said vessel in a closed mouth position and being free to move to an open mouth position, said domed lid being articulated for movement about said handle to which it is movably attached;

a right-angled hinge disposed between said domed lid and said horizontal handle arm, said hinge having a substantially vertical hinge arm strapped to said horizontal handle arm and a substantially horizontal hinge arm attached to said domed lid, said horizontal hinge arm being rotatively pinned at a hinge funcrum to said vertical hinge arm and having a stop abutment for mating engagement with a limit abutment on said vertical hinge arm, said stop and limit abutments having an open angle of approximately 110 degrees of arc relative to said closed mouth position of said lid; and

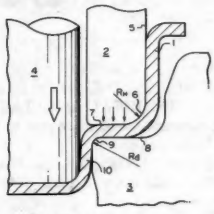
a thumb actuator disposed in a substantially vertical position directly over said vertical hinge arm and integrally attached to said horizontal hinge arm for rotating said domed lid through the approximately 110 degrees of arc from said closed position to said open position.

4,984,708

REDRAWING METHOD AND DRAWN-REDRAWN CAN

Katsuhiro Imazu; Tomomi Kobayashi, both of Yokohama; Masao Ishinabe, Atsugi, and Hisao Iwamoto, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 313,843, Feb. 23, 1989. This application May 23, 1990, Ser. No. 527,469
Claims priority, application Japan, Feb. 23, 1988, 63-38579
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—660 **1 Claim**



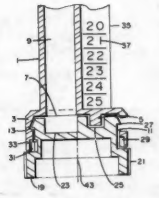
1. A drawn-redrawn can formed of a covered metal sheet, wherein the entire draw ratio is in the range of from 2.0 to 4.0, the side wall portion is thinned to a thickness corresponding to 60 to 95% of the bare sheet thickness on the average, the ratio of the thickness of the upper portion of the side wall to the thickness of the lower portion of the side wall is less than 1.5, and the drawn-redrawn can has such a covering completeness that the enamel rater value (mA) of the lower portion of the side wall is smaller than 5 times the enamel rater value (mA) of the lower portion of the side wall.

4,984,709

NON-REVERSING TABLET DISPENSER WITH COUNTER

Jack Weinstein, Manchester, N.J., assignor to Primary Delivery Systems, Inc., Annandale, N.J.

Filed Feb. 5, 1990, Ser. No. 475,371
Int. Cl.[5] G07F *11/04*
U.S. Cl. 221—7 **19 Claims**



1. A container for dispensing tablets in a non-reversing manner, which comprises:

(a) a main container body adapted to receive at least one stack of tablets and having an operating end with at least one annularly located dispensing orifice and at least one annularly located ejection post extending away from said body, and further adapted to receive and rotatably hold an

actuator disk so as to render it rotatable about a central axis;

(b) an actuator disc securely and rotatably attached to the operating end of said body so as to render it rotatable about said central axis, said actuator disk having a first recess which forms a complete annulus about said central axis and is coincidental to and mates with said ejection post, and having a second recess of width and depth sufficient to receive a predetermined number of one or more tablets, said second recess having an inward end which is at least coincidental with said dispensing orifice when located thereunder and an outward end which is open for tablet dispensing; and,

(c) stop means to assure that said actuator disk can only be rotated in one direction;

such that when said body contains stacked tablets, said actuator disk is rotated so that said second recess is located under said dispensing orifice and at least one tablet drops into said second recess, and upon further rotation, the tablet(s) resting in said second recess is ejected by being pushed against said ejection post.

4,984,710

ARTICLE DISPENSING MECHANISM FOR CYLINDRICAL ARTICLES

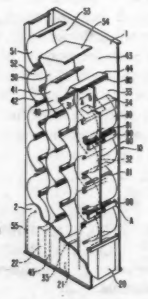
Katsumi Oike, Kobayashi, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed May 23, 1989, Ser. No. 355,353

Claims priority, application Japan, May 23, 1988, 63-66746[U]

Int. Cl.[5] B65H *31/20*

U.S. Cl. 221—242 **1 Claim**



1. In an article dispensing mechanism for use in a vending machine, said mechanism comprising

first and second side plates facing one another at a predetermined spacing;

at least two pairs of serially cusp-shaped panels disposed substantially horizontally between said side plates to define at least first and second vertically progressive serpentine tracks each of which has an upper end and a lower end;

an article loading space communicating with each said upper end; and

an article dispensing space communicating with each said lower end, the improvement comprising:

a vertically extended, generally planar spacer member that is horizontally movable between said second side plate and said first side plate along said first serpentine track to adjust the depth of said first serpentine track relative to said first side plate independently of the depth of said second serpentine track, said spacer member exhibiting fixing plates extending perpendicular to the generally planar surface of the spacer member; and

adjustment means for releasably adjusting the horizontal position of said spacer member relative to said first side plate, said adjustment means comprising at least one bracket connected to said first side plate and extending toward said side plate, and a screw passing through a longitudinal aperture in one of the brackets and into a threaded hole in one of the fixing plates.

4,984,711

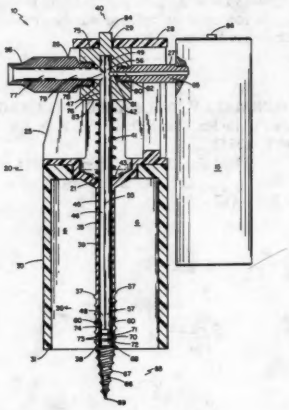
WINE DISPENSER

Charles V. Ellis, 241 Tremont St., Newton, Mass. 02158

Filed Oct. 23, 1989, Ser. No. 425,488

Int. Cl.[5] B65D *83/14*

U.S. Cl. 222—82 **11 Claims**



1. A wine dispensing device coupled to a bottle of wine through the bottle's cork for dispensing the contents and supplying a desired gas from an attached gas source to the exclusion of undesired ambient air, comprising:

A. a base mounting sleeve having a generally cylindrical shape, comprising:

a hollow lower portion which fits over a wine bottle neck;

a hollow upper portion;

an internal radial flange at the junction of said lower and upper portions; and

a hollow cylindrical tube extending downward from said radial flange, having an inner wall whose diameter is approximately equal to the inner diameter of said radial flange, and having a lower section whose exterior portion is threaded;

in combination with:

B. a delivery assembly, comprising:

a hollow screw assembly concentrically positioned within said base mounting sleeve, comprising:

an elongated liquid tube concentrically positioned within said base mounting sleeve cylindrical tube and having an inner wall and upper and lower ends;

an elongated gas tube longitudinally positioned within said liquid tube and having upper and lower ends; and

a tip structure terminating the hollow screw assembly and having three sections, the top section of which is concentrically positioned within said base mounting sleeve cylindrical tube and has an outer diameter less than the inner diameter of said cylindrical tube inner wall, a midsection positioned concentrically just within said cylindrical tube and having an outer diameter slightly less than the inner diameter of said cylindrical tube and greater than the outer diameter of said top section and thereby forming a radial cavity between said tip structure top section and said inner wall of said cylindrical tube into which cavity said liquid and gas tube lower ends terminate and open, and a bottom section extend-

ing beneath said cylindrical tube tapering downward to a point and whose exterior whose exterior

a "T" shaped dual channel element contained within said base mounting sleeve upper portion having a main channel into which said hollow screw assembly terminates, and two branch channels splitting off from said main channel, into one of which said liquid tube joins and into the other one of which said gas tube joins;

a spring positioned around that portion of the hollow screw assembly contained within said upper portion of said base mounting sleeve and having a top end and a bottom end, the top end of which abuts said channel element and the top end of which rests on said base mounting sleeve internal radial flange;

a gas feed element interconnecting said gas branch channel to said attached gas source; and

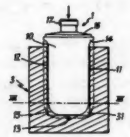
a pourer connected to said liquid branch channel.

4,984,712

DISPENSER FOR A LIQUID OR A PASTE PUT UNDER PRESSURE BY PRIOR DEFORMATION OF A RESILIENT RECEPTACLE

Claude Jouillat, Montigny sur Avre, France, assignor to S.T.E.P., Avre, France

Filed Jan. 6, 1989, Ser. No. 293,915
Claims priority, application France, Jan. 8, 1988, 88 00122
Int. Cl.[5] B65B *3/16*
U.S. Cl. 222—95 **9 Claims**



1. A dispenser for a substance in the form of a liquid or a paste, said dispenser comprising:

a deformable receptacle operable between at least a small and a large volume configurations and being designed to rest in said small-volume configuration the inside volume of said receptacle varying as a function of its state of deformation, the operation of filling said receptacle being conducted while said receptacle is mechanically constrained in said large volume configuration sot hat, after the mechanical constraining has been removed said substance is put under pressure as a result of said receptacle seeking to return toward its rest configuration,

a valve operative to close said receptacle and being suitable for ensuring that air cannot penetrate into said receptacle at any stage,

wherein said deformable receptacle is designed so that the mechanical constraining necessary to put said receptacle in said large volume configuration is obtained by introducing said receptacle into a hollow formed in an undeformable part.

4,984,713

CARBONATED BEVERAGE DISPENSER

Gary C. Chambers, Box 157, Rt. 79, Burdett, N.Y. 14818, and Ernest E. Brand, Jr., R.D. #3, Box 204, Corning, N.Y. 14830

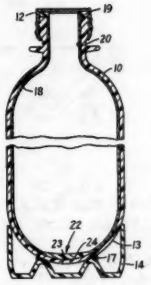
Filed Mar. 31, 1987, Ser. No. 32,241
Int. Cl.[5] B65D *35/56*
U.S. Cl. 222—105 **7 Claims**

4. A receptacle for pressurized carbonated liquid, said receptacle comprising

an outer container of substantially fixed shape formed with a mouth at one end thereof defining an opening into said outer container,

an inner container for holding a fluid, said inner container being disposed within said outer container and being formed with a mouthpiece of substantially fixed shape defining an opening into said inner container, at least a portion of the mouthpiece of said inner container being disposed at the mouth of said outer container, at least a major portion of said inner container being collapsible,

venting means located along said outer container at a region distal from said mouth for admitting air between said inner and outer containers to permit collapse of said inner container when fluid is poured therefrom, said venting means comprising at least one aperture in the bottom of said outer container, and



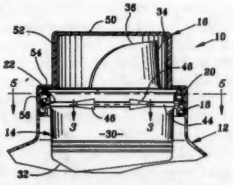
means for sealing said venting means when said carbonated liquid causes the pressure inside said inner and outer containers to exceed the pressure outside said outer container, thereby preventing extrusion of said inner container through said venting means when pressure builds up in said inner container, said means for sealing comprising a thickened wall on that end of said inner container opposite said mouthpiece, the remaining portion of said inner container other than aid thickened wall having a substantially uniform thickness, said thickened wall being sufficiently thick that it prevents extrusion of said inner container through said at least one aperture when said carbonated liquid causes the pressure inside said inner and outer containers to exceed the pressure outside said outer container.

4,984,714

SPOUTED BOTTLE

Larry C. Sledge, Midlothian, Va., assignor to Specialty Packaging Licensing Company, Wilmington, Del.

Filed Jan. 9, 1990, Ser. No. 462,213
Int. Cl.[5] B67D *1/16*
U.S. Cl. 222—109 **10 Claims**



1. In a molded spout component for a spouted molded bottle, the bottle having a normally upward circular mouth with threads formed on the outside thereof and a groove about the inside surface of the mouth with an inward protrusion in the

groove, the spout being one piece and comprising a downward generally cylindrical outer wall, an inwardly directed annular bottom wall and a doubled-back upward cone-like spout wall having an opening at its upper end, the annular bottom wall being formed with a combined vent-and-drain-back passage outward and upward seal means about the per end of the outer wall adapted to rest on the top of the mouth of the bottle, the improvement of a pair of closely spaced outward lugs molded into the outer wall of the spout adjacent the upper end thereof, the spout adapted to fit snugly inside the mouth with the lugs snapped into the groove on opposite sides of the protrusion to thereby limit rotation of the spout with respect to the mouth of the bottle.

4,984,715

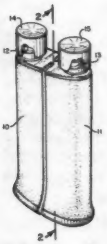
TWIN COMPARTMENT SQUEEZE BOTTLE

Richard D. Green, 1150 18th St., Ste. 101, Santa Monica, Calif. 90403

Continuation of Ser. No. 550,465, Nov. 10, 1983, abandoned. This application Jan. 9, 1986, Ser. No. 817,777

Int. Cl.[5] B65D *37/00*

U.S. Cl. 222—129 **2 Claims**



1. A twin compartment bottle comprising an integral body of flexible plastic material defining first and second compartments constituting substantially mirror images of each other on opposite sides of a vertical plane and having adjacent walls in side-by-side relationship integrally connected by a central vertical web, said adjacent walls of said compartments extending outwardly in opposite directions from said web in closely spaced nondiverging relation whereby said walls cooperate with each other and with said web to support the bottle in a stable manner in a self-standing upright position, each compartment having an upper neck outlet and a separate removable closure for said outlet, the bottoms of said compartments being generally flat and coplanar so that said bottle is self-standing whereby the closure of a compartment can be removed and the ingredient in said compartment expressed through its neck outlet by manual squeezing of the compartment without having to invert the bottle.

4,984,716

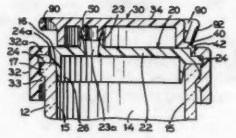
TWO PIECE TAMPER EVIDENT HINGED CLOSURE CAP

James M. Beck, Carol Stream, Ill., assignor to Creative Packaging Corporation, Wheeling, Ill.

Filed Mar. 1, 1989, Ser. No. 317,542

Int. Cl.[5] B67B *5/00*

U.S. Cl. 222—153 **4 Claims**



1. A tamper evident closure for a container having an opening for dispensing contents therein, comprising:

(a) a base section engaged within said opening, said base section including a central plate section that covers said opening, an orifice in said central plate section, an annular wall that depends downwardly from said central plate section such that an outside diameter of said annular wall engages an inside diameter of said opening, and a flange that extends radially outward from said annular wall and over a top edge of said opening, said flange forming a horizontal surface at a level below that of an upper surface of said plate section;

(b) a skirt member adapted to engage about said opening in non-removable fashion and to retain said base section in engagement with said opening, skirt member including an inwardly extending flange that overlays said outwardly extending flange of said base section, a circumferential groove that rings an inside diameter of said skirt member so as to capture said radially outwardly extending flange of said base section, and a circumferential bead that also rings the inside diameter of said skirt member so as to engage beneath an outwardly directed bead on an outside diameter of the top edge of said opening;

(c) a cap member hinged attached to said skirt member by means of a living hinge member, said cap member adapted to move between opened and closed positions and including a stopper member on said cap member adapted to engage said orifice in said central plate section when said cap member is in its closed position, said cap member being positioned on said central plate section in its closed position;

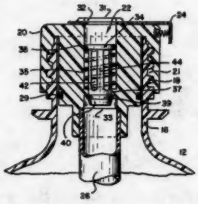
(d) a pair of tear strips connecting said cap member and said skirt member by means of integrally molded frangible connections to both said skirt member and said cap member, said tear strips being shaped so as to follow a contour of a lower edge of said cap member and connecting between said inwardly extending flange of said skirt member and said lower edge of said cap member, said tear strips precluding movement of said cap member to its open position without breaking of said frangible connections; and

(e) a grasping member attached to said tear strips and elevated above said skirt member, said grasping member substantially comprising a ring concentrically positioned about a top edge of said cap member and including two downwardly depending legs that extend down to and attach to terminal ends of said tear strips positioned adjacent opposite sides adjacent said living hinge member so that said frangible connections can be broken by grasping and upward pulling of said ring member.

4,984,717
REFILLABLE PRESSURIZED BEVERAGE CONTAINER

John W. Burton, #4 Woodland Dr., Pittsburgh, Pa. 15228

Filed Dec. 6, 1988, Ser. No. 280,697
Int. Cl.[5] B67D *5/06*
U.S. Cl. 222—183 23 Claims

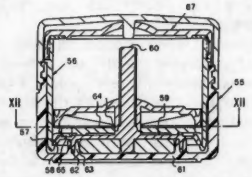


1. A refillable, reusable container suitable for automatic filling and pressurization, capable of discharging a liquid stream at the container and able to be connected to a discharge tube through which a liquid stream may be carried to a remote location and there discharged comprised of a top having an opening, a base and at least one wall attached between the top and the base which together define an enclosed space, a removable, reusable, resealable cap connected to the top, covering the opening and sealing the container and at least one spring loaded valve attached to said cap, said valve having a basket portion comprised of a substantially open top, a bottom and side supports between the top and the bottom with passageways therebetween for filling the container with a liquid stream, pressurizing and emptying the container in a liquid stream containing all liquids contents or any portion of said contents of the container, said container being sized and constructed so as to be capable of retaining fluid at pressures above atmospheric pressure, said valve being capable of being opened by one of a tubular filler probe and a discharge nozzle having a tubular probe which engages and opens the valve when the probe moves and pushes toward the enclosed space and said valve being closed when the valve is not pushed toward the enclosed space and when open said valve has passageways sized and positioned to permit a liquid to easily flow through said valve at substantially the same volume per second flow rate as a rate at which the liquid may flow through the probe.

4,984,718
DISPENSING CONTAINER FOR A VISCOUS FLUID OR SOLIDIFIED STICK-SHAPED PRODUCT, PARTICULARLY FOR COSMETICS

Ennio Cardia, 18 Via Durazzo, I-00195 Roma RM, Italy

Filed Mar. 10, 1989, Ser. No. 321,819
Claims priority, application Italy, Mar. 11, 1988, 47711 A/88
Int. Cl.[5] B67D *5/42*
U.S. Cl. 222—390 2 Claims



1. Dispensing container for a viscous fluid, of the type in which the fluid is supported on a driving member having a rotational and sliding movement in the container, including an outer tubular body (55) having an inner surface of circular cross-section, an open top end and a lower end closed by a closure bottom (61), and a threaded rod (60) coaxial to the outer body, an inner tubular body (56) coaxial to said outer body, having an outer surface in sliding contact with the inner surface of the outer body and an opening at its top end, said inner and outer bodies being further engaged by restraining means which prevent relative movement thereof in an axial direction and enable a relative rotational movement around their common longitudinal axis and said inner body protruding beyond the top of the outer body; said driving member being movable by rotational and sliding movement along said rod upon a relative rotation of the outer body and the inner body,

said rod being engaged with said closure bottom so as to be integral therewith, and said driving member being threadedly engaged with said rod and shaped to apply an elastic pressure to the inner surface of the inner body to produce an elastic friction force between said driving member and said inner body which enables an axial movement of said driving member and having means producing a fluid-tight axial sealing between said driving member and said inner surface of the inner body,

a lower wall (59) integral with said rod (60), provided with an annular skirt (62) and said closure bottom (61) of the outer body (55) has an annular skirt (63) for an assembly in an integral manner of the rod to said closure bottom,

said restraining means which prevent a relative axial movement of the outer (55) and the inner body (56) comprise a peripheral flange (58) on said lower wall (59) integral with the rod and an annular ridge (57) at a lower end of the inner body (56) and;

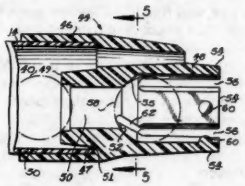
said inner body (56) further comprising an integral partition wall (64) extending transversely to said longitudinal axis having elastic tabs (65) concentrically arranged around the rod, which are able to slide on a toothed configuration fixed with respect to said outer body to prevent an undesired relative backwards movement of the rod and the inner body;

said partition wall being placed between said lower wall (59) and said top end of the inner body, and said toothed configuration (66) being provided on said lower wall (59).

4,984,719
SHOT DISPENSER

John S. Brunton, Auckland, New Zealand, assignor to Illinois Tool Works, Inc., Glenview, Ill.

Filed Apr. 10, 1989, Ser. No. 335,871
Int. Cl.[5] G01F *11/26;* B67D *3/00*
U.S. Cl. 222—454 10 Claims



1. A shot dispenser for dispensing a controlled volume of liquid from a bottle, comprising:

a spout having vent and dispensing passageways defined therein;

vent and dispensing tubes being respectively disposed in communication with said vent and dispensing passageways;

a first ball movably disposed within said dispensing tube;

a first valve seat disposed adjacent to a dispensing end of said dispensing tube against which said first ball is adapted to seat so as to prevent further dispensing of liquid when said dispenser is disposed in a tilted pouring position;

ball cage means mounted upon an interior end of said dispensing tube such that a first end thereof disposed toward said first valve seat defines a stop for said first ball when said dispenser is disposed upright in a non-dispensing position, a second end of said ball cage means includes means for retaining a second ball within said ball cage means, and means intermediate said first and second ends of said ball cage means defining a second valve seat for said second ball and

at least one bleed slot defined within said second valve seat for predeterminedly controlling the fluid flow rate of said liquid through said second valve seat such that said predetermined fluid flow rate, in turn, controls the speed at which said first ball moves within said dispensing tube from said stop toward said first valve seat, once said second ball has seated against said second valve seat when the dispenser is disposed in said pouring position so as to substantially close off an interior end of said dispensing tube yet leave said at least one bleed slot in communication with said interior end of said dispensing tube and said first ball so as to control said speed of movement of said first ball within said dispensing tube toward said first valve seat.

4,984,720

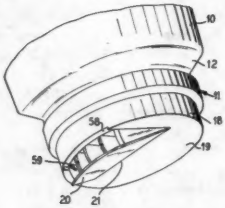
SIDE DISPENSING CLOSURE

Robert J. Groya, Norridge, and Richard W. Hofman, Chicago, both of Ill., assignors to Magenta Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 234,568, Aug. 22, 1989, abandoned. This application Mar. 1, 1989, Ser. No. 317,463

Int. Cl.[5] B67D *5/06*

U.S. Cl. 222—531 **7 Claims**



1. An annular molded plastic container closure cap comprising a peripheral annular skirt having internal means formed thereon for fixing the closure cap to a container and an annular top closing one end of the skirt, a hinged top portion being joined to the top at a hinge connection remote from a periphery of the top being pivotable from a closed position to an open position to open and close an opening formed in said top adjacent periphery of said top, said hinged top portion terminating at the periphery of said top at a dispensing opening, sidewalls for hinged top portion depending from an undersurface of said hinged top portion, said side walls being formed as a conical section and being bowed outwardly to maintain an outer surface of said walls in tight sealing contact with an opening sidewall in a top wall of the closure as said hinged portion moves between an open and closed position, a solid panel interconnecting said sidewalls at a forward end of said sidewalls remote from said hinge connection and adjacent said periphery, said panel having means thereon cooperating with a lip extending inwardly of the periphery of said top to limit opening of said hinged top portion, and said panel having at least one opening therethrough for dispensing material contained in said container.

4,984,721

GARMENT HANGER

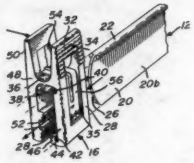
Stan Eiley, Mount Royal, and Marc Tremblay, Pierrefonds, both of Canada, assignors to E.R.A. Display Co. Ltd., Montreal, Canada

Filed Sep. 7, 1989. Ser. No. 404,203

Int. Cl.[5] A47G *25/48, 25/44, 25/14*

U.S. Cl. 223—96 **3 Claims**

1. A garment hanger comprising a hook member and a linear beam, the beam having a generally planar web portion with first and second faces and T shaped track means at the upper edge thereof and at least a pair of clips mounted on the beam, one on each side of the hook member and each adapted to travel on the beam in a limited path extending from the respective ends of the beam, each clip of the pair of clips being separate one-piece molded clips of plastics material and each having a first and second jaw joined by a bridge and a separate spring member associated with the first and second jaw to urge the bottom portion of the second jaw towards the second face of the beam about a hinge axis through the bridge, said first jaw and said bridge defining track following seat means to slidably engage the T shaped track means on the beam and the first jaw is also provided with a hook-shaped flange at the bottom end



to slidably engage the bottom edge of the beam and cooperating gripping means on the second jaw and the second face of the web in the form of elongated ribs such that the second jaw can engage, with the second face of the beam, and hold the garment therebetween at any position of the clip in the limited path of travel thereof.

4,984,722

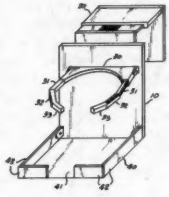
ADJUSTABLE CUP HOLDER

Steven W. Moore, 5926-145th St. S.W., Edmonds, Wash. 98020

Filed Apr. 25, 1990, Ser. No. 514,101

Int. Cl.[5] B60R *7/00*; A47K *1/08*

U.S. Cl. 224—42.43 **5 Claims**



1. A cup holder comprising a holder back plate onto which is removably attached a door-mounting bracket means useful for automobile doors, an upper bracket, and a lower cover plate, the upper bracket and the lower cover plate extending horizontally from the holder back plate when in use, with means for mounting the holder back plate to the doormounting bracket and for pivotably mounting the upper bracket and the lower cover plate to the holder back plate, the improvement therein comprising

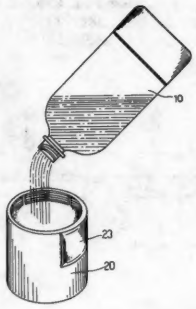
in the upper bracket, a pair of opposing arms comprised of a plurality of connected lengths and extending from the upper bracket horizontally, each pair of adjacent lengths forming an obtuse angle between them, the plurality of lengths cumulatively approximating an arc each directed, respectively, toward its opposing are which also presents an approximate arc in a similar manner said upper bracket having a pair of apertures extending outwardly with respect to each other and at an angle less than perpendicular with respect to said back plate, a first length of each opposing arm slidably inserted into said fitted upper bracket apertures, respectively, each arm also having a series of regular, parallel grooves along its first length which, when the arm is inserted into the aperture, act in combination with an extrusion in the upper bracket aperture, the extrusion extending into a selected groove at a desired arm extension position.

4,984,723

ASSEMBLY OF BEVERAGE BOTTLE/CAN AND CUP

Li-Ling Hsu, No. 311, Tun-Hwa North Road, Taipei, Taiwan

Filed Oct. 26, 1989, Ser. No. 426,998
Int. Cl.[5] A47G *23/02*; B65D *21/00*, *23/08*
U.S. Cl. 224—148 2 Claims



1. A drinking cup adapted for insertion onto the lower end portion of a factory-sealed beverage container, wherein said container includes an annular cylindrical side wall having a smooth uninterrupted outer surface;

said drinking cup comprising a cylindrical side wall defining a cup axis, said side wall having a plural number of axially-spaced projections (21) extending circumferentially along its inner surface for frictional gripment of the beverage container side wall outer surface, whereby the cup is frictionally adherred to the beverage container; each circumferentially-extending projection having a number of air vent grooves (22) extending therethrough, whereby the cup interior space is in open communication with the ambient atmosphere when the cup is inserted onto a beverage container.

4,984,724

FLASHLIGHT CARRYING STRAP

Rex L. Johnston, 12715 Mapleview Street, #23, Lakeside, Calif. 92040

Filed Oct. 27, 1989, Ser. No. 428,325
Int. Cl.[5] A45F *3/14*
U.S. Cl. 224—257 9 Claims

1. An adjustable flashlight carrying strap for adjustably securing a flashlight against the body of a person for hands free holding of the flashlight in selected light directing orientations, comprising:

an elongated main shoulder strap for extending over a shoulder;

a first flashlight case gripping strap having elastomeric gripping means on an inner surface thereof for engaging and gripping an outer surface of a flashlight body and non-pivotally secured at a mid portion to one end of said shoulder strap, and having hook and loop fastening means on opposite ends thereof;

a second flashlight case gripping strap having elastomeric gripping means on an inner surface thereof for engaging and gripping an outer surface of a flashlight body and non-pivotally secured to the other end of said end strap transverse thereto and having complementary hook and loop fastening means on each end thereof for detachably securing around the body of a flashlight; and

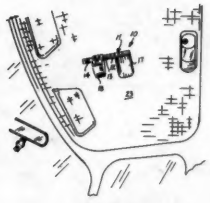
a take up buckle at one end of said shoulder strap between the said one end and one of said first and second gripping straps for selectively adjusting the length of the said shoulder strap and for securing a flashlight therein against a side of a person in selected light directing orientations.

4,984,725

VEHICULAR HOLSTER MOUNT APPARATUS

Deron L. Urbom, 207½ 4th Ave., Holdrege, Nebr. 68949

Filed Mar. 15, 1990, Ser. No. 493,848
Int. Cl.[5] B60R *7/04*
U.S. Cl. 224—311 7 Claims



1. A vehicular holster mount apparatus for securement of a holster to an interior roof surface of a vehicle, wherein the holster includes an elongate pocket to receive a pistol, with a loop mounted to a rear surface of the pocket, the apparatus comprising,

an elongate, rigid spine member including a first end and a second end, with spaced right and left sides, the spine member further including a series of fastener means for securement of the spine to the interior roof surface, and

a plate member orthogonally and coextensively mounted to the first end of the spine to receive the loop therearound, and

a flexible strap member secured to the spine adjacent the second end of the spine for securement about a lower portion of the holster.

4,984,726

VEHICLE ROOF RACK

Bryan H. Marshall, Glebe, Australia, assignor to Unistrut Australia Pty. Limited, Mt. Druitt, Australia

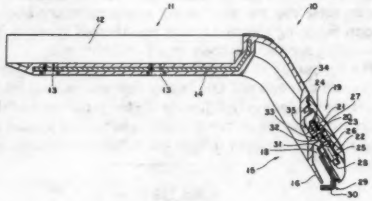
Filed Jan. 23, 1990, Ser. No. 468,581
Claims priority, application Australia, Jan. 23, 1989, PJ2370
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—331 5 Claims

1. A vehicle roof rack mounting to receive an end of a roof rack bar which extends across a vehicle upon which the mounting is to be received, said mounting comprising:

a body which in use is generally upwardly extending from a vehicle gutter engaging portion to a bar engaging portion, said body having a flange spaced from said gutter engaging portion towards said bar engaging portion and having a face projecting away from said gutter engaging portion, said flange also having an aperture; and

a clamp assembly including a cap, a threaded rod rotatably supported in said cap and passing through the aperture in said flange, a nut threadably mounted on said rod and abutting said face, a clamp bracket having a lip to engage

a gutter portion of the vehicle, and an opening through which said rod passes so that said rod is rotatable about its longitudinal axis relative to said bracket, and wherein said rod has an abutment surface facing said nut and which



engages said bracket so that upon rotation of said rod in a predetermined rotational direction said bracket is caused to move towards said nut to move said bracket into a clamping position with respect to the vehicle gutter.

4,984,727

DEVICE FOR CUTTING A TEXTILE FILAMENT

Antonio Jimenez, Meyrin, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

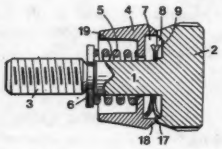
PCT No. PCT/CH88/00159, § 371 Date Mar. 17, 1989, § 102(e) Date Mar. 17, 1989, PCT Pub. No. WO89/03447, PCT Pub. Date Apr. 20, 1989

PCT Filed Sep. 13, 1988, Ser. No. 350,559

Claims priority, application Switzerland, Oct. 7, 1987, 3912/87

Int. Cl.[5] D05B *65/00*

U.S. Cl. 225—83 **4 Claims**



1. A device to cut a textile thread and to retain at least one of its bits by pinching between two members urged against each other by a spring, one of these members being constituted by a head of a shank, the other member surrounding this shank, a space being provided between this other member and the head of the shank, a cutting member being disposed in said space, characterized in that the cutting member is constituted by a piece mounted on a portion of the shank which passes through said space, this piece having at least one leg extending radially into said space, this leg having a slot extending inwardly from its end, towards the shaft to define two parts of the leg located on either side of the slot and arranged to diverge outwardly from a radial plane perpendicular to the axis of the shaft, so as to provide between them a Vshaped throat for receiving and cutting the thread.

4,984,728

DUAL BELT CONVEYOR FOR MULTI-PLY CONTINUOUS PAPER TUBING

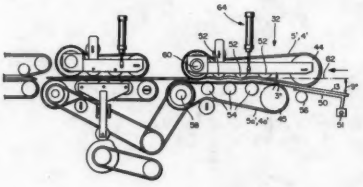
Friedhelm Brinkmeier, Lengerich, and Horst Rautenberg, Lienen, both of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Jan. 24, 1989, Ser. No. 300,987

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1988, 3803058; May 26, 1988, 3817928

Int. Cl.[5] B65H *20/00*

U.S. Cl. 226—172 **8 Claims**



1. A dual belt conveyor for continuous paper tubing comprising

upper and lower endless conveyor belts between which the tubing is fed, said upper and lower endless conveyor belts extending substantially horizontally,

turning point pulleys and backing rolls for the upper belts, the pulleys and backing rolls for the upper belt are offset lengthwise from the pulleys and backing rolls for the lower belt so that the tubing is moved through the conveyor along an undulating path,

an inlet turning point pulley of the upper belt being positioned upstream of an inlet turning point pulley of the lower belt so that the upper belt contacts the tubing before the lower belt,

said inlet turning point pulley being positioned to extend through a central plane of conveyance extending between said upper and lower endless conveyor belts, and

means for feeding the continuous tubing to the conveyor with an inclination at an acute angle to the central plane of conveyance of the dual belt conveyor to initially contact the upper belt at said inlet turning point pulley at a location offset from the central plane of conveyance.

4,984,729

EASY ACCESS METAL STAPLE STAPLER

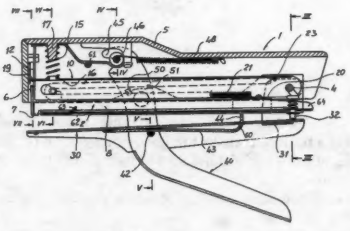
Giorgio Balma, Viale della Repubblica, 13, 27058 Voghera (Pavia), Italy

Filed Apr. 3, 1989, Ser. No. 332,622

Claims priority, application Italy, Apr. 22, 1988, 20317 A/88

Int. Cl.[5] B25C *5/02, 5/11*

U.S. Cl. 227—128 **3 Claims**



1. A metal staple stapler comprising a metal staple loading body provided with a pair of ears supporting a pivot pin, an

outer casing pivoted on said pivot pin, said outer casing including a pressing member, a closure member housing resilient pushing means actuating a staple driver, under said loading body there being provided a clamp for closing said metal staples, actuating lever being furthermore provided articulated at an intermediate position thereof on said clamp, said actuating lever including a top hook portion removably engageable with a pressing roller sliding on a track of said outer casing, through said clamp being formed a slot therein there is engaged a curved end of a leaf spring held in an operating position by a restraining pin.

4,984,730

QUALITY CONTROL FOR WIRE BONDING

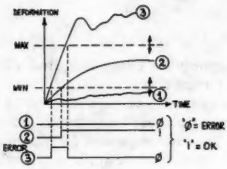
Bernd Göbel, Inning am Holz, and Andreas Ziemann, Erding, both of Fed. Rep. of Germany, assignors to Emhart Inc., Towson, Md.

Filed Nov. 3, 1989, Ser. No. 432,092

Claims priority, application United Kingdom, Nov. 11, 1988, 8826488

Int. Cl.[5] B23K *20/10*; H01L *21/607*

U.S. Cl. 228—1.1 3 Claims



1. A wire bonding apparatus for bonding aluminum wire to the contact surface of an electronic component comprising

an ultrasonic vibration transducer, including a horn,

a bonding wedge secured to one end of said horn, representative of the displacement of said bonding wedge,

means for converting said sinusoidal signal to a DC voltage representing a direct measurement of the movement of said bonding wedge, and

means for defining an acceptable window of acceptable DC voltages at the conclusion of a bonding operation.

4,984,731

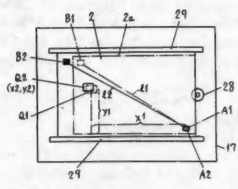
METHOD OF PACKAGING ELECTRONIC COMPONENT PARTS USING A EUTECTIC DIE BONDER

Tetsuichi Imamura, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 5, 1989, Ser. No. 417,427

Int. Cl.[5] H01L *21/58*

U.S. Cl. 228—102 6 Claims



1. A method of packaging electronic component parts using a eutectic die bonder comprising the steps of: placing a substrate on a movable table which is provided in a heating unit; measuring the thermal expansion of the substrate while heating the substrate; and moving the movable table in accordance with the result of measurement so as to modify the bonding coordinates of an electronic component part.

4,984,732

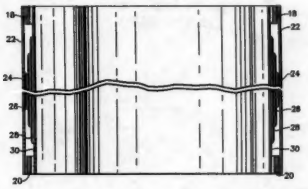
METHOD OF SUPERPLASTICALLY FORMING AND DIFFUSION BONDING A LAMINATE ASSEMBLY

Earl K. Hudson, Bonita; Romulo M. Martinez, Chula Vista, and James R. Woodward, La Jolla, all of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Feb. 3, 1989, Ser. No. 305,565

Int. Cl.[5] B21D *39/00*

U.S. Cl. 228—173.2 8 Claims



1. A method of fabricating a part of a metal capable of exhibiting superplasticity, the part having at least one region of extreme deformation, comprising the steps of:

providing a plurality of sheets of said metal;

sizing and positioning at least one of said sheets in overlapping relationship with the remaining sheets to provide additional metal adjacent the region of extreme deformation to be formed, said one sheet having an area smaller than an area of any of the remaining sheets;

positioning the overlapped sheets adjacent a tool having the shape of the part to be formed;

heating the sheets so that they exhibit superplasticity;

forcing the sheets against the tool to form them into the part; and

subjecting the formed sheets to heat and pressure sufficient to result in diffusion bonding of the overlapped sheets;

whereby a predetermined nominal gauge is achieved throughout the formed part.

4,984,733

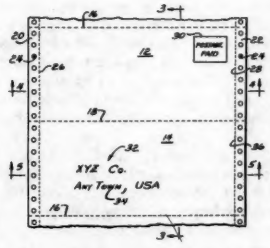
DUAL MAILER CONSTRUCTION

Daniel L. Dunn, Jr., Glendale Heights, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Sep. 7, 1989, Ser. No. 403,814

Int. Cl.[5] B65D *27/06, 27/08, 27/10, 27/34*

U.S. Cl. 229—72 9 Claims



1. A dual mailer comprising:

first and second stuffed envelope assemblies in side-by-side relation and joined by a line of weakening;

one of said envelope assemblies being franked while being free of address information;

the other of said envelope assemblies including an address receiving area while being free of a frank;

a first message contained within said first envelope assembly; and

a second message different from said first message contained within said second envelope assembly.

4,984,734

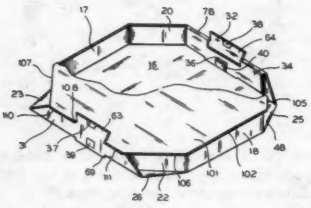
STACKABLE ARTICULATED CARTON TRAY APPARATUS

Kenneth J. Zion, New Lenox, and Allan J. Tison, Kearney, Mo., assignors to Stone Container Corporation, Chicago, Ill.

Filed Sep. 29, 1989, Ser. No. 414,922

Int. Cl.[5] B65D *5/20*

U.S. Cl. 229—109 **20 Claims**



1. A stackable articulated carton tray apparatus for flat food products, particularly pizza pies, which apparatus is capable of being stacked in successively adjacent multiple quantities upon one another such that a bottom panel of an upper carton apparatus forms a cover for an adjacent lower carton apparatus, and joinable in a manner so as to prevent the shifting and separation of the stacked carton apparatuses during transport, to thereby enable the packaging of multiple pizza pies without the additional material, expense and labor incurred in providing each pizza pie with its own complete container, said apparatus comprising:

bottom panel means for forming a bottom to each said carton tray apparatus;

a first pair of upstanding opposite first and second side wall means operably attached to and emanating upwardly from said bottom panel means for forming at least two of the side walls of said carton tray apparatus;

a second pair of upstanding opposite third and fourth side wall means operably attached to and emanating upwardly from said bottom panel means for forming at least two of the side walls of said carton tray apparatus;

tray locking means operably positioned on one or more of said respective upstanding first, second, third and fourth side wall means emanating upwardly from said bottom panel means, for maintaining said first, second, third and fourth side wall in a restrained articulated shape;

a plurality of corner panel means attached at opposite ends of one or more of said first and second pairs of side wall means and further attached to an adjacent edge of said bottom panel means for forming substantially diagonal corner wall means upon articulation of said carton apparatus;

corner tab means operably attached to said plurality of corner panel means along substantially continuous corner tab fold edges therebetween, said corner tab means being restrainably interposed between adjacent respective ones of said one or more first, second, third and fourth side wall means upon the articulation of said carton apparatus, by said tray locking means, toward formation and maintenance of a substantially rigid articulated tray member;

stacking means emanating from one or more of said first, second, third and fourth side wall means for aligning and releasably joining multiple like ones of said carton tray apparatuses in stacked configuration; and

detachable cover panel means operably positionable upon the uppermost one of a plurality of said like tray members, as a top closure to the food product positioned within said uppermost tray member.

4,984,735

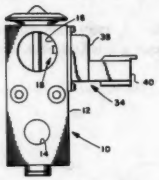
SENSING REFRIGERANT TEMPERATURE IN A THERMOSTATIC EXPANSION VALVE

Thomas F. Glennon, Darien, and Robert J. Torrence, Addison, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 19, 1990, Ser. No. 495,182

Int. Cl.[5] F25B *41/04*

U.S. Cl. 236—92 B **6 Claims**



1. A valve assembly for controlling flow of refrigerant to a heat exchanger comprising:

(a) body means defining an inlet adapted for receiving pressurized refrigerant, said body means including means for restricting flow and an outlet for discharging flow at a significantly reduced pressure, said outlet adapted for connection to said heat exchanger;

(b) means defining a continuous passage through said body means, said passage adapted for connection to receive therethrough refrigerant flow discharging from a heat exchanger;

(c) said body means defining a port communicating exteriorly with said continuous passage;

(d) means defining a cup shaped closure for said port, said closure sealingly attached thereover with the open end of said cup shape exteriorly thereof;

(e) thermistor means received in said cup shape and including electrical attachment means accessible exteriorly of said closure and adapted for electrical attachment thereto; and,

(f) a thermally conductive fluidized medium disposed in said cup shape about said thermistor for providing heat-transfer between said cup-shaped closure and said thermistor.

4,984,736

HEATER FOR MOTOR VEHICLES WHICH CAN BE OPERATED ON SEVERAL POWER SETTINGS

Peter Reiser, Esslingen; Edwin Steiert, Stuttgart, and Wolfgang Schaffert, Aichschiess, all of Fed. Rep. of Germany, assignors to J. Eberspächer, Esslingen, Fed. Rep. of Germany

Filed Jun. 9, 1989, Ser. No. 363,679

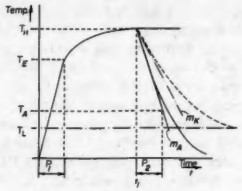
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1988, 3820442

Int. Cl.[5] G05D *23/00*

U.S. Cl. 237—2 A **4 Claims**

1. A heater for motor vehicles which can be operated on several settings as an auxiliary and an add-on heater including a burner running on liquid fuel supplied by a pump and a heat exchanger surrounding a chamber of the burner, comprising operation control means having a control circuit including a sensor reacting to temperature changes emitting a temperature-dependent electrical output signal changeable with time, said control means repeatedly generating values from the electrical output signals of said sensor characterizing the speed with which the temperature changes, wherein said control

circuit including analysis means, which compares the values of the speed with which the temperature changes at the heat



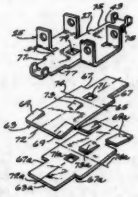
exchanger, to at least one set value and to thereby determine whether a flame blow-off has occurred or whether no flame was ignited once the burner has been started.

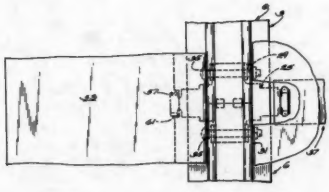
4,984,737

MOBILE SHELVING APPARATUS

James C. Muth, Eagle, and James J. Slattery, North Prairie, both of Wis., assignors to Spacesaver Corporation, Fort Atkinson, Wis.

Filed Feb. 24, 1989, Ser. No. 315,137
Int. Cl.[5] E01B 9/42; A47F 5/00
U.S. Cl. 238—281 **19 Claims**





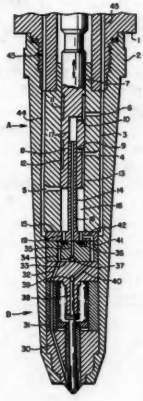
1. Mobile shelving apparatus comprising:
a. carriage means for storing selected items;
b. wheel means for supporting the carriage means for rolling motion; and
c. at least two sets of rails placed on a building floor for supporting and guiding the wheel means thereon, each set of rails comprising:
i. a plurality of rails placed in endwise abutment to thereby create joints between adjacent rails;
ii. rail support means for underlying the joints between adjacent abutting rails and for fastening the rails thereto; and
iii. shim means for underlying the rail support means and for interlocking therewith to enable the rails to be leveled along the builidng floor, wherein the rail support means comprises a plurality of rail support brackets, each rail support bracket having a flat base with a central portion that defines at least one opening therethrough, at least one arm extending from the base central portion, the arm defining a notch in at least one outside corner thereof, the base central portion opening and the arm notch cooperating with the underlying shim means to interlock therewith.

4,984,738

UNIT INJECTOR FOR STAGED INJECTION

Knut L. Winquist, San Antonio, Tex., assignor to Association of American Railroads, Washington, D.C.

Filed Sep. 18, 1985, Ser. No. 777,347
Int. Cl.[5] F02M 45/08, 57/02
U.S. Cl. 239—88 **6 Claims**



1. A unit injector for injecting fuel in an internal combustion engine, said unit injector comprising a fuel pump and a spray nozzle combined in a single unit adapted to be mounted on said engine with said fuel pump being adapted to be driven by a mechanism provided on said engine, the improvement comprising means for producing a plurality of discrete fuel injections during a single stroke of said internal combustion engine, said fuel pump comprising means defining a first relatively large diameter cylinder, a first relatively large diameter plunger positioned at least partially within said first cylinder and adapted to be driven along the longitudinal axis of said cylinder by said mechanism provided on said engine for pumping said fuel, an end of said first plunger within said first cylinder defining an end of a first fuel compression chamber of said pump within said first cylinder, said end of said first plunger having a second relatively small diameter cylinder formed therein, a second plunger extending through said first fuel compression chamber and into said second cylinder for relative movement in said second cylinder as said first plunger is driven by said mechanism, an end of said second plunger within said second cylinder defining an end of a second fuel compression chamber of said pump within said second cylinder, fuel inlet and outlet passage means for conveying fuel to and from said first and second fuel compression chambers, said inlet and outlet passage means being arranged to be opened and closed by the movement of said first plunger in said first cylinder and relative to said second plunger for producing discrete fuel injections from said first and second fuel compression chambers during a single stroke of said first cylinder.

4,984,739

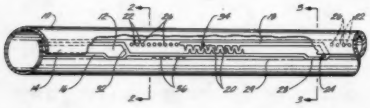
DRIP IRRIGATION HOSE

Davies Allport, 9650 Camino Ruiz, San Diego, Calif. 92126

Continuation-in-part of Ser. No. 892,420, Aug. 4, 1986. This application Jan. 22, 1988, Ser. No. 147,814

Int. Cl.[5] B05B *1/36, 15/00*

U.S. Cl. 239—193 **2 Claims**



1. A drip irrigation hose comprising:

an elongated flat sheet of flexible water impervious material bent along its length to form an overlapping longitudinal seam between opposing inner and outer longitudinal margins of the sheet;

first and second longitudinally extending rib like adhesive beads interconnecting the opposing margins to seal the overlapping seam and to form a flow regulating tube defined by the rib like beads and the margins, the bead closest to the outer margin extending beyond its edge;

a plurality of inlets to the flow regulating tube distributed at intervals along the hose; and

a plurality of outlets from the flow regulating tube distributed at intervals along the hose displaced from the respective inlets.

4,984,740

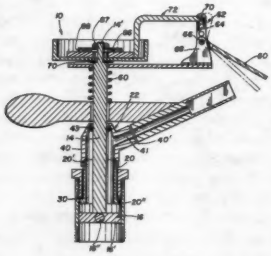
WATER SPRINKLER WITH VARIABLE STREAM-DISTANCE ADJUSTMENT

Robert B. Hodge, 430 Driftwood St., Morro Bay, Calif. 93442

Filed Jun. 19, 1989, Ser. No. 367,872

Int. Cl.[5] B05B *3/04*

U.S. Cl. 239—232 **18 Claims**



1. In a lawn-sprinkler comprising a sprinkler-head and a stationary frame, said sprinkler-head comprising means forming a water-passageway through which water flows, nozzle-means in fluid communication with said water-passageway and through which the water discharges, mounting means for mounting said means forming a water passageway and said nozzle-means for rotation relative to said stationary frame, and a water-flap mounted by said mounting means for rotation therewith, said water-flap being operatively associated with said nozzle means for controlling the distance to which the water-discharge stream projects from said nozzle means, the improvement comprising:

means for variably adjusting said water-flap relative to said nozzle-means during one complete cycle of said mounting means in order to vary the position of said water-flap at least one time during said one complete cycle;

said means for variably adjusting comprises means for pivotally mounting said water-flap to said nozzle means, and means for locating said water-flap in a desired pivoted location by pivoting said water-flap a desired amount about said means for pivotally mounting, said means for locating comprising a first portion in operative communication with said water-flap for causing the pivotal rotation thereof about said means for pivoting, and a second portion spaced from said first portion; and a plurality of horizontally, individually-slidable guide-elements stationarily mounted by said frame, said plurality of guide-elements being arranged in a circular array and being mounted above said mounting means for mounting said means forming a water passageway and said nozzle-means for rotation relative to said stationary frame, each said guide-element defining a radially-outer contact surface against which said second portion of said means for locating may abut for controlling the movement of said first portion for varying the pivoted-state of said water-flap, said second portion of said means for locating being movable in a horizontal direction by at least chosen ones of said radially-outward contact surfaces of said guide-elements.

4,984,741

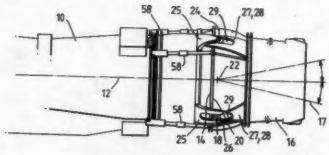
VECTORABLE VARIABLE FLOW AREA PROPULSION NOZZLE

Douglas J. Nightingale, Jonesboro, Ga., assignor to Rolls-Royce Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 19,121, Feb. 26, 1987, abandoned. This application Jun. 1, 1988, Ser. No. 200,850

Int. Cl.[5] B63H *25/46*

U.S. Cl. 239—265.17 **11 Claims**



1. A vectorable variable area propulsion nozzle for a gas turbine aero-engine, the nozzle comprising a first duct having a longitudinal axis, a second duct having a longitudinal axis, a gimbal attachment means for connecting an upstream end of the second duct to a downstream end of the first duct thereby to allow universal swivelling of the second duct relative to the first duct so that the longitudinal axis of the second duct intersects the longitudinal axis of the first duct at a fixed swivel point when the second duct is swivelled, and a first actuator means operable on the second duct to swivel the second duct relative to the first duct, the second duct comprising a supporting ring which is free to swivel relative to the first duct but is constrained against rotation about its longitudinal axis by means of circumferentially spaced pivots, of the gimbal attachment means, the supporting ring having a plurality of guide means extending in a direction along the axis, there being a plurality of first flaps which define the geometry and outlet area of the nozzle and the flaps being provided with means

which co-operate with the guide means to define a trackway along which the flaps can move bodily relative to the supporting ring thereby to vary the outlet area of the nozzle, and actuator means operable to move the flaps along the guide means.

4,984,742

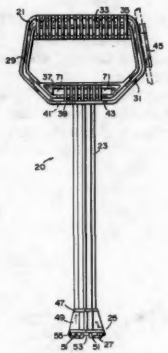
CONTAINER AND PUMP ASSEMBLY

Garry L. Ellison, Grand Rapids, and Kim W. Sears, Middleville, both of Mich., assignors to Root-Lowell, Ohio

Filed Aug. 11, 1989, Ser. No. 392,719

Int. Cl.[5] B05B *9/043*

U.S. Cl. 239—373 **18 Claims**



1. A manual pump for pressurizing a closed container comprising:

a pump cylinder for confining air to be compressed;

a unitary member comprising a handle, a piston rod, a pump valve seat, and a split disc air release for compressing air in said pump cylinder;

a resilient member on said unitary member between said pump valve seat and said split disc air release for forming an airtight seal between said pump valve seat and said pump cylinder on the compression stroke of said unitary member and for opening said airtight seal and admitting air to said pump cylinder through said split disc air release on the return stroke; and

a resilient valve on one end of said pump cylinder for releasing pressurized air from said pump cylinder and for blocking the entrance of liquid into said pump cylinder.

4,984,743

PESTICIDE SPRAY NOZZLE

James D. Chaddock, deceased, late of Midland, and Perry Chaddock, executor, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 18,325, Feb. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 718,611, Apr. 1, 1985, Pat. No. 4,662,565, which is a continuation-in-part of Ser. No. 592,776, Mar. 26, 1984, abandoned. This application Jan. 17, 1989, Ser. No. 345,278

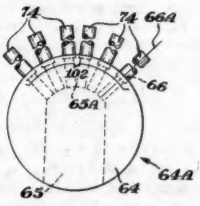
Int. Cl.[5] B05B *1/14*

U.S. Cl. 239—559 **8 Claims**

1. A spray nozzle assembly for spraying a swath up to 50 feet in width which comprises a generally solid body having substantially parallel opposed faces and a circumferential edge, at least a portion of said circumferential edge describing an arcuate face;

a major-sized borehole extending normally into said circumferential edge from a direction opposite the arcuate face and substantially transversely into but not through the solid body, the borehole terminating in an end face within the solid body;

a plurality of angularly arrayed minor-sized boreholes intersecting the end face of said major-sized borehole and extending through the arcuate-faced edge of said solid body, said minor-sized boreholes each having an axis intersecting the major-sized borehole end face substantially perpendicular to the end face, the minor-sized boreholes communicating with the major-sized borehole;



a spray outlet tube adapted to deliver a solid liquid stream mounted in each of said minor-sized boreholes; and

means for coupling the major-sized borehole to a source of liquid pest control composition under operable pressure for spraying.

4,984,744

ELECTROMAGNETICALLY ACTUATABLE VALVE

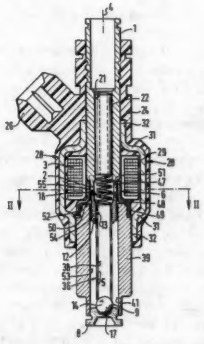
Rudolf Babitzka, Kirchberg-Neuhof; Ferdinand Reiter, Markgroeningen, and Peter Romann, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 20, 1989, Ser. No. 424,644

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843862

Int. Cl.[5] B05B *1/30*

U.S. Cl. 239—585 **24 Claims**



1. An electromagnetically actuatable valve in a fuel injection valve for fuel injection systems in mixture-compressing internal combustion engines having externally supplied ignition, said fuel injection valve including a connection neck (1) that forms a fuel inlet, a core (2) formed on an inner end of said connection neck, said core is surrounded by a magnet coil (3), an armature (12) oriented axially toward one end of said core (2), an outer connecting part (39) connected at an upper end to said core (2), said outer connecting part including an inner bore

(41), an outlet including a valve seat body (8) and a valve seat (9) secured to a lower end of said connecting part and a hollow inner connecting element coaxial with said outer connecting part (39) disposed concentrically to a longitudinal valve axis (4), said hollow inner connecting part firmly joined at one end to the armature and firmly joined at its other end to a valve closing element, and said hollow inner connecting element (11; 36) is formed of an axially resilient elastic material with at least one opening along its length, said fuel being communicated from said fuel inlet through said cores to an upstream end of said inner connecting element and through said at least one opening to said valve seat, said armature, inner connecting element and valve closing element being movable between positions permitting and preventing fuel flow through said outlet.

4,984,745

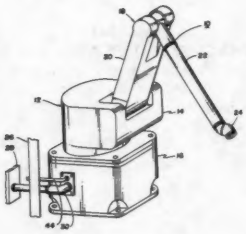
ELECTRIC ROBOT FOR USE IN A HAZARDOUS LOCATION

Hadi A. Akeel, Sterling Heights, and Antoni J. Malarz, Troy, both of Mich., assignors to GMF Robotics Corporation, Auburn Hills, Mich.

Continuation of Ser. No. 183,452, Apr. 14, 1988, abandoned, which is a continuation of Ser. No. 928,641, Nov. 6, 1986, abandoned, which is a continuation of Ser. No. 692,996, Jan. 22, 1985, abandoned. This application Jun. 20, 1989, Ser. No. 370,123

Int. Cl.[5] B25J *19/00*

U.S. Cl. 239—587 **23 Claims**



1. An electrically driven robot adapted for use in a hazardous environment, comprising:

a base having a first hollow-base section and also having a second hollow-base section mounted for rotational movement on the first base section, and a circular seal that extends between the first and second base sections to cooperate therewith in defining an airtight first compartment;

a first drive mechanism including at least one electric motor received within the airtight first compartment;

an arm assembly including an inner arm mounted for movement on the base and an outer arm mounted for movement on the inner arm, said arm assembly being driven by the first drive mechanism to move the inner and outer arms, and one of said arms of the arm assembly having an airtight second compartment fluidly communicated with the airtight first compartment of the base;

a second drive mechanism including at least one electric motor within the second compartment defined by the arm assembly;

a wrist mechanism mounted on the outer arm of the arm assembly and driven by the second drive mechanism;

a cable bundle extending to the first hollow-base section and into the airtight first compartment of the base and having at least one cable connected to the first drive mechanism to operate the electric motor thereof, and said cable bundle including at least one other cable that extends through the circular seal of the base and from the airtight first compartment of the base into the airtight second compartment of the arm assembly and being connected to the second drive mechanism to operate the electric motor thereof;

a pressurized gas supply that feeds pressurized gas into the airtight first compartment of the base and thence into the airtight second compartment of the arm assembly to provide pressurized gas that surrounds the electric motors and the cables of the cable bundle within the compartments, whereby the robot is capable of operating in the hazardous environment; and

communicating means for fluidly communicating the first and second compartments, said pressurized gas supply feeding pressurized gas through said communicating means and into the second compartment.

4,984,746

UNDER CARRIAGE SPRAYER FOR AUTOMOBILES OR THE LIKE

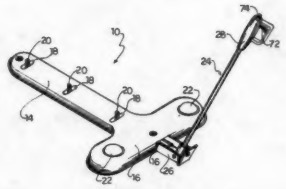
George L. Joyal, St. Malo, Canada, assignor to George Enterprise Ltd., St. Malo, Canada

Filed Jan. 10, 1989, Ser. No. 295,451

Claims priority, application Canada, Jan. 13, 1988, 556469

Int. Cl.[5] B08B *3/00*

U.S. Cl. 239—722 **14 Claims**



6. An under carriage sprayer for automobiles or the like:

a frame;

a plurality of wheels supporting the frame for movement over a floor;

an elongate spray conduit mounted on said frame for rotation about a longitudinal axis;

a plurality of nozzles spaced along said conduit for spraying liquid from the conduit in a direction determined by the rotational position of the conduit;

a handle;

means connecting the handle to the frame adjacent one end of the conduit for moving the frame over the floor by manipulation of the handle; and

means on the handle for rotating the conduit.

4,984,747

CHOPPING- AND SLICING MACHINE

Magister H. Lechner, Kaiseraufstieg 30, A-6330 Kufstein/Ebbs, Austria

Filed Jun. 9, 1989, Ser. No. 363,677

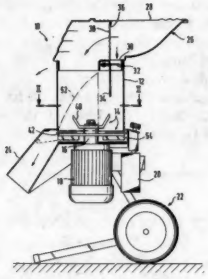
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1988, 8807794[U]

Int. Cl.[5] B02C *18/2*

U.S. Cl. 241—55 **11 Claims**

1. A combined chopping and shredding machine with an inlet each for the material to be chopped and the material to be shredded, with a crushing chamber containing the material to be crushed which is equipped with a cutting and crushing device as well as an electric drive unit which rotates the crushing device, and a lateral outlet funnel through which the material centrifugally exits after it has been crushed, characterized in that the material is fed in via one funnel (26) which is suited for feeding in both hard and soft crushing material and has a receiving inlet (28) which is laterally displaced in relation to

the crushing chamber (12), said crushing chamber (12) having a small straight passage which is formed by the receiving inlet (28) and a small inlet (30) parallel to the receiving inlet and a wide angular passage which can be fed by the receiving inlet (28) and a big inlet (36) which is perpendicular to the receiving



inlet, and that the crushing device comprises a set of blades (14) with blade beaters (40, 48) for chopping which are mounted in one direction of rotation and blade cutters (50) for shredding which are mounted in the opposite direction of rotation and a drive unit (18) with reversible direction of rotation and that the drive unit (18) is driven directly.

4,984,748

WASTE STERILIZING AND CRUSHING APPARATUS

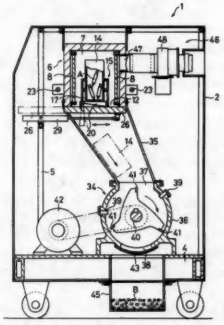
Ikuo Kimura, Hyogo, Japan, assignor to Kyokuto Kaihatsu Kogyo Co., Ltd., Nishinomiya, Japan

Filed Mar. 9, 1990, Ser. No. 489,911

Claims priority, application Japan, Mar. 13, 1989, 28331[U]; Mar. 13, 1989, 1-28332[U]; Sep. 29, 1989, 1-115696[U]

Int. Cl.[5] B02C *19/00*

U.S. Cl. 241—65 **6 Claims**



1. A waste sterilizing and crushing apparatus comprising a heating chamber adapted to receive wastes; a heater for heating the interior of said heating chamber; a discharge port formed in the bottom of said heating chamber for downwardly discharging the wastes received in said heating chamber; a cover plate driven by drive means to open and close said discharge port; a crusher disposed below said heating chamber for crushing the wastes; and feeding means whereby the wastes discharged through said discharge port are fed into said crusher.

4,984,749

OPERATION CONTROLLING METHOD FOR TEXTILE MACHINE

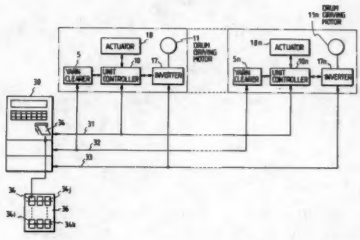
Isamu Matsui, and Shoichi Tone, both of Kyoto, Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 28, 1989, Ser. No. 344,702

Claims priority, application Japan, May 6, 1988, 63-110724

Int. Cl.[5] B65H *54/20*

U.S. Cl. 242—35.5 R **20 Claims**



1. Apparatus for controlling the operation of a plurality of yarn processing units, wherein each yarn processing unit is operable with a corresponding yarn clearer, the apparatus comprising;

a storage device for storing data corresponding to processing unit operating conditions to which the yarn processing units can be set;

a control device, operatively connected with the storage device, the control device comprising:

first control means for setting operating conditions for each processing unit according to the processing unit operating conditions corresponding to the stored data;

second control means for calculating and automatically setting a clearing condition for the yarn clearer associated with each unit dependent on the processing unit operating conditions corresponding to the stored data; and

communication means for transmitting data between the first control means and the second control means.

4,984,750

METHOD AND APPARATUS FOR REPLACING WEB-LIKE MATERIAL IN A WEB-LIKE MATERIAL SUPPLYING DEVICE

Toshio Shigeta, Chiba; Yoshio Kishi, Tokyo; Toshihide Kohata, Tokyo, and Makoto Sakano, Tokyo, all of Japan, assignors to Tokyo Automatic Machinery Works Ltd., Tokyo, Japan

Filed Jun. 30, 1989, Ser. No. 373,409

Claims priority, application Japan, Jul. 1, 1988, 63-165747; Jul. 1, 1988, 63-165748; Jul. 1, 1988, 63-88423[U]; Jun. 16, 1989, 1-154050

Int. Cl.[5] B65H *19/18, 19/20*

U.S. Cl. 242—58.1 **43 Claims**

1. A web-like material supplying apparatus for feeding web-like material adapted to be wound into a reel, along a transport path, the apparatus comprising:

(a) a reel holding portion onto which said reel is loaded at an upstream end of the apparatus;

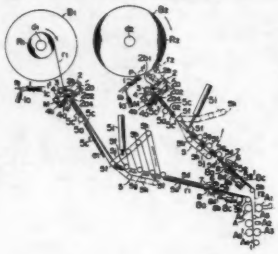
(b) means for gripping one end of said material, said gripping means being located downstream of said reel holding portion, said gripping means including an attraction surface and a movable member which moves towards and away from said attraction surface;

(c) a cutter located downstream of said gripping means movable in and out of the transport path for cutting an end portion of the web-like material;

(d) means for conducting a cut piece of the web-like material to a discharge path outside of the transport path, said

conducting means being located downstream of said cutter; and

(e) a peeling member located adjacent said reel holding portion for peeling of an end of the web-like material from the reel, said peeling member including a first plate



adapted to contact the outer periphery of the reel to separate an end of the material from the remainder of the material, and a receiving plate arranged substantially parallel to said first plate of said peeling member, whereby material separated from the outer periphery of the reel moves between said first plate and said receiving plate.

4,984,751

SPOOL FOR STRIP-FORM RECORDING SUBSTRATES, IN PARTICULAR FOR PHOTOGRAPHIC FILMS

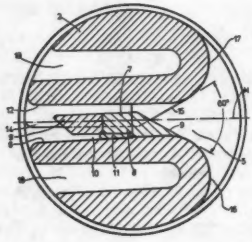
Franz Hoffacker, Langenfeld; Guido Kovacic, Unkel, and Hermann Lührig, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,494

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447215

Int. Cl.[5] G03B *19/04*; B65H *75/28*

U.S. Cl. 242—74 **4 Claims**



1. A spool for receiving a strip of recording substrate comprising in combination

a cylindrical core having a longitudinal slit parallel to the spool axis along a central plane of the core

a pair of core parts formed by said longitudinal slit, one on each side of the central plane and the core parts having a pair of opposed slit surfaces positioned on opposite sides of the central plane and a pair of external surfaces positioned on opposite sides of the central plane,

said core parts having open recesses on the side of the core parts diametric to the entry and formed between the slit and the external surfaces,

means formed in said slit engageable with an end of a recording substrate inserted in said slit,

said means comprising at least one hook positioned in said slit, having a shaft for engaging the substrate and a foot of the hook positioned in the slit on one of the core parts spaced outside of the central plane of the spool core,

a pair of circular cylindrical transitional surfaces formed on the respective core parts situated at the respective side of the central plane each forming an arc portion of more than 90° and having a radius of curvature of at least one sixth of the diameter of the core and angularly spaced from each other to provide an entry for the recording substrate to the slit and the hook, and each circular cylindrical transitional surface connecting one of the slit surfaces with one of the external surfaces,

so constructed and arranged that said transitional surfaces form a funnel-shaped entry to said slit for engagement of the recording substrate on the hook through the entry with the hook foot juxtaposed with one of said transitional surfaces.

4,984,752

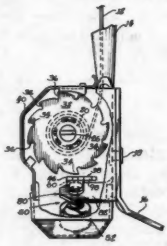
SAFETY BELT RETRACTOR AND METHOD OF MANUFACTURE

Samuel M. Marrs, Bourbonnais; Victor Herodes, Worth, and David Ransom, Bonfield, all of Ill., assignors to Occupant Safety Systems Inc., Olympia Fields, Ill.

Filed May 4, 1989, Ser. No. 347,355

Int. Cl.[5] B60R *22/40*

U.S. Cl. 242—107.4 A **12 Claims**



1. In a vehicle sensitive seat belt retractor comprising a frame, a reel having a safety belt thereon, reel mounting means for rotatably mounting said reel on said frame in a first direction to unwind the belt from the reel, ratchet means connected to said reel to rotate therewith and having a plurality of ratchet teeth thereon, and pawl means for engagement with said ratchet teeth and moveable from an inoperative position engaging at least one ratchet tooth so as to block the rotation of said reel associated with unwinding of the belt from said reel, an improved means for urging said pawl means into engagement with said at least one ratchet tooth, comprising:

said frame including a plurality of walls forming a reel-receiving cavity;

said reel mounting means including a support shaft supported by the walls of said frame means

said pawl means including means for mounting to the walls of said frame means at a fixed position with respect to said reel support shaft;

an inertia means having an end for actuating said pawl means toward said blocking position when subjected to external forces;

a support plate integrally formed with and struck from and extending from a wall of said frame, said support plate defining an aperture adjacent said pawl means through which the end of the inertia means extends and locating the end of the inertia means at a precise predetermined position relative to the pawl means; said support plate having an outer free end and having a fold line with its associated wall of the frame,

said support plate being at a compound angle with respect to the plane of the wall of the retractor, and gusset walls

formed at the fold line in the support plate and in the retractor wall and disposed at angle to the retractor wall and to the support plate to stabilize the support plate against deflection toward or away from the wall and a change in either one of the compound angles.

4,984,753

TAPE CASSETTE

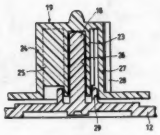
Shigehiro Nishimura, Mito, Japan, assignor to Victor Company of Japan, Ltd., Japan

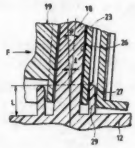
Filed Oct. 23, 1989, Ser. No. 425,257

Claims priority, application Japan, Oct. 24, 1988, 63-138496[U]

Int. Cl.[5] G03B *1/04*; G11B *15/32*

U.S. Cl. 242—199 **10 Claims**





1. A tape cassette, comprising:

a cassette body molded of a synthetic resin and formed to have an internal space defined therein;

a cantilevered reel shaft integrally molded with said cassette body and extending from an inner surface of said cassette body into said internal space to be perpendicular to said inner surface when not subjected to a lateral load;

a reel hub rotatably supported on said reel shaft, said reel hub having a cylindrical inner bearing wall having an inner cylindrical surface and an outer cylindrical surface and a generally cylindrical outer tape-retaining wall joined concentrically with said inner bearing wall for winding there around a magnetic recording tape, said inner cylindrical surface of said inner bearing wall forming a central bearing hole shaped and sized to rotatably receive said cantilevered reel shaft therein; and

a tubular reinforcement wall integrally molded with said cassette body in concentric relation to said cantilevered reel shaft and loosely fitted around said inner bearing wall, said reinforcement wall being shaped and sized to be engageable with said outer cylindrical surface of said inner bearing wall to limit a bending of said cantilevered reel shaft when said cantilevered reel shaft is subjected to a lateral force.

4,984,754

HELI-HOVER AMPHIBIOUS SURFACE EFFECT VEHICLE

Arthur Yarrington, M.S. 1073 Crows Nest, Queensland, Australia 4355

Continuation of Ser. No. 198,818, Mar. 28, 1988, abandoned. This application Mar. 28, 1990, Ser. No. 501,350

Claims priority, application Australia, Jul. 28, 1986, PH7155

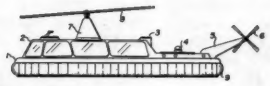
Int. Cl.[5] B64C *37/02*

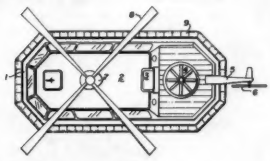
U.S. Cl. 244—2 **5 Claims**

1. A heli-hover amphibious craft, comprising: a main hover craft fuselage body structure including a single hull provided with a deck, said hull being defined by a compartmental under base cavity extending downward with divisional and perimeter walls formed by air cushion containing means for containing suspension air, said fuselage body being provided with at least one built-in duct extending through said deck to said base cavity;

at least one deck mounted fan means for delivering pressurized air through said duct;

a superstructure attached to said fuselage body;





at least one horizontally rotating heli-rotor assembly supported well above said deck by said superstructure, said heli-rotor assembly being driven by a substantially vertically fixed shaft;

anti-torque means mounted on an aft end of said fuselage body; and

a drive means operatively connected to said heli-rotor assembly and anti-torque means for propelling the craft.

4,984,755

AIRCRAFT LANDING GEAR HAVING WHEELS THAT SWIVEL WHILE THE LANDING GEAR IS BEING RETRACTED

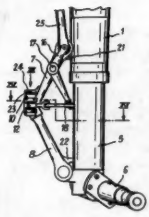
Michel Derrien, Versailles, France, assignor to Messier-Hispano-Bugatti, Montrouge, France

Filed Feb. 21, 1990, Ser. No. 482,815

Claims priority, application France, Feb. 28, 1989, 89 02566

Int. Cl.[5] B64C *25/10*

U.S. Cl. 244—102 SS **8 Claims**



1. Retractable aircraft landing gear comprising a strut fitted with means for pivoting it to the structure of an aircraft, means for raising the strut, a sliding rod mounted to slide within the strut and supporting a wheel axle, and a scissors linkage comprising a top branch having a top end pivoted to the strut and a bottom branch having a bottom end pivoted to the sliding rod, wherein the landing gear includes articulated means having one end pivoted to a bottom end of the top branch of the scissors linkage, and an opposite end pivoted to a top end of the bottom branch of the scissors linkage, and control means for controlling the articulated means to move between a folded

position in which the bottom end of the top branch of the scissors linkage and the top end of the bottom branch of the linkage are adjacent, and an unfolded position in which the bottom end of the top branch of the scissors linkage and the top end of the bottom branch of the linkage are spaced apart from each other.

4,984,756

ARRANGEMENT FOR LOADING A CARGO COMPARTMENT, IN PARTICULAR THAT OF AN AIRCRAFT, WITH PIECE GOODS

Helmner Anders, Uppakra, Sweden, assignor to Scandinavian Bellyloading Company Aktiebolag, Lund, Sweden

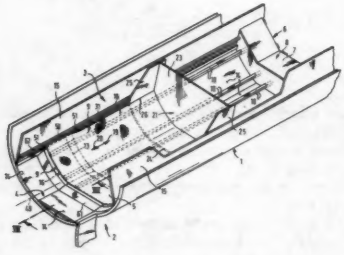
PCT No. PCT/EP87/00246, § 371 Date Jan. 12, 1989, § 102(e) Date Jan. 12, 1989, PCT Pub. No. WO87/06909, PCT Pub. Date Nov. 19, 1987

PCT Filed May 12, 1987, Ser. No. 322,477

Claims priority, application Fed. Rep. of Germany, May 12, 1986, 3615927

Int. Cl.[5] B64D 9/00

U.S. Cl. 244—137.1 19 Claims



1. Arrangement for loading a cargo compartment (3) of an aircraft having a curved fuselage floor with piece goods, with at least one conveying device (9), able to be moved by a motor from a loading aperture (5) of an aircraft cargo compartment (3) outwardly in a direction toward its opposite end (6) and back,

which device covers the curved surface of the aircraft fuselage floor (14) of the cargo compartment (3), and by means of which piece goods placed on the conveying device (9) in the region of the loading aperture (5) can be conveyed away from the loading aperture (5) into the cargo compartment (3) and back in the direction of the loading aperture (5) during unloading,

which device comprises a plurality of high-tensile flexible tensioning elements (belts 10), disposed adjacently to each other, which are held at the end (6) of the cargo compartment (3) opposite the loading aperture (5),

which device features in a portion at least approximately equivalent to the depth of the cargo compartment (3) a carpetlike conveying surface (18) of a flexible textile material, and

which device is reversed over a plurality of rotatable reversing rolls (84) arranged in the area of the loading aperture (5),

characterized in that

the reversing rolls (84) are fixed to a guide profile (13) arranged between the upper and lower portions of the conveying device (9), said guide profile being curved to conform the guide profile (13) to, and the conveying surface (18) being curved to conform to, the curved surface of the aircraft fuselage floor (14) of the cargo compartment (3),

the motor drive (8) for the conveying device (9) is positioned in the area of the end (6) of the conveying compartment (3) opposite the loading aperture (5), and

the guide profile (13) is supported against the tensile stress of the conveying device (9) at its side opposite to the reversing rolls (84) by a slide plate (96;143) supported against the drive (8) at the opposite end.

4,984,757

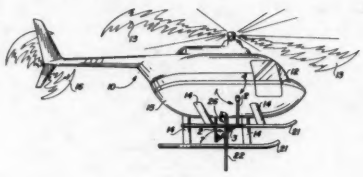
TRAPEZE MOUNT FOR AIRBORNE TREE TRIMMING APPARATUS

Joe Hartung, 52 Robin Dr., Ventress, La. 70783, and William C. Cox, III, 2016 Shadowood Ct., Columbia, S.C. 29212

Filed May 30, 1989, Ser. No. 358,594

Int. Cl.[5] B64D 1/12

U.S. Cl. 244—137.4 21 Claims



1. A trapeze mount for an airborne tree trimming apparatus having a boom adapted for pivotal mounting to a helicopter, said trapeze mount comprising a boom mount bar having one end pivotally attached to the helicopter, with the opposite end of said boom mount bar attached to the boom, pivot bar means pivotally carried by the helicopter and collar means pivotally attached to said pivot bar means, said collar means slidably engaging said boom mount bar, whereby the boom is selectively adapted for deployment downwardly in cutting configuration when the helicopter is airborne and in substantially horizontal configuration for selective attachment to the helicopter and detachment from the helicopter.

4,984,758

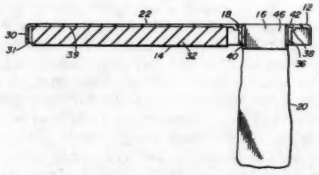
SCRAP CATCHER

Diane P. Young, 3627 Clear Falls, Kingwood, Tex. 77339

Filed Apr. 25, 1989, Ser. No. 343,151

Int. Cl.[5] B65B 67/00

U.S. Cl. 248—95 11 Claims



1. A fabric scrap disposal system comprising:

a mounting base having a generally flat upper surface;

an aperture dispósed through said mounting base;

a bag disposed through said aperture having its open end disposed adjacent and below said mounting base flat upper surface;

a flanged retainer mounted within said aperture such that said open end of said bag is disposed between said retainer and said aperture;

said bag open end received and supported between said retainer and said aperture, such that said retainer is received in the interior of said bag; and

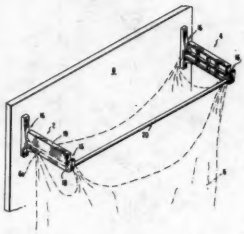
said flanged retainer including a lip portion not extending above the upper surface of said mounting base.

4,984,759

CONTAINER SUPPORT WITH IMPROVED BAG HOLDING MEANS

Sigmund Periant, 1332 NW. 14 Ave., Pompano Beach, Fla. 33069

Filed Mar. 21, 1989, Ser. No. 326,765
Int. Cl.[5] B65B 67/04; A47F 5/00
U.S. Cl. 248—99 14 Claims



1. A container support for supporting a bag having straps against the downward force of gravity, said container support comprising first and second unconnected elongated rigid arm members each containing means for horizontally mounting said first and second arm members to a vertical supporting surface with said arm members extending in a lengthwise direction substantially perpendicular to said supporting surface, said first and second arm members forming a transversely extending space therebetween;

each of said arm members having a substantially flat and continuous lower surface;

wherein each of said first and second arm members has, at opposite longitudinal ends thereof, two generally downwardly extending slots formed in an upper surface of each arm member for receiving said straps of said bag, each of said slots being formed with a bottom portion means, which is wider in said lengthwise direction than a portion of said slots that is immediately upwardly adjacent to said bottom portion, for positively preventing said straps from working out of said slots and for positively preventing upward movement of a mechanical element which is transversely inserted into both of said slots of both of said arm members and which is complementary in shape to that of said slots; and

wherein the bottom portion means of the slots in each arm member lie in a common plane which is parallel to the longitudinal dimension of the arm member so that the bottom portions of both arm members lie in a common horizontal plane when the arm members are horizontally mounted on a vertical supporting surface;

said container support further comprising a removable shelf member having leg means, with a shape complementary to that of said slots and bottom portion means in each of said arm members, for securely supporting said shelf member in and on said arm members in such a manner that, after said leg means are transversely inserted into said slots, said shelf member is locked against upward movement thereof.

4,984,760

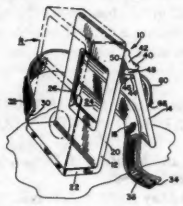
DUAL-USE HOLDER FOR POCKET-SIZED ELECTRONIC APPLIANCE OR THE LIKE

Arnold K. Cohn, 1415 Meadow La., Glenview, Ill. 60025, and Charles W. Elterman, 20777 N. Laurel Dr., Barrington, Ill. 60010

Filed Aug. 7, 1989, Ser. No. 390,604
Int. Cl.[5] F16M 13/00
U.S. Cl. 248—126 8 Claims

1. A dual-use holder for a pocket-sized electronic appliance or the like, said holder being useful alternatively in a first orientation wherein said holder can be steadily rested on a generally horizontal surface and in a second orientation wherein said holder can be removably attached to a generally vertical surface;

said holder having a back wall, which is adapted to prevent such an appliance from falling backwardly as held by said holder in either orientation, the back wall having a pair of transverse ribs defining a transverse slot, said holder having means for preventing such an appliance from falling



forwardly, laterally, or downwardly as held by said holder in either orientation;

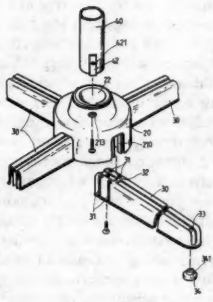
said holder having a back prop, which has a transverse flange fitting snugly into the transverse slot to attach the back prop to the back wall at an acute angle with respect to the back wall and which is adapted to prevent said holder from tipping backwardly when said holder in its first orientation is rested on a generally horizontal surface, and at least one suction cup attached to the back prop for removably mounting said holder in its second orientation to a generally vertical surface.

4,984,761

ELECTRIC FAN CROSS-SHAPED BASE

Ying-Fu Chen, No. 140-66, Che Lu Chien, Pao An Tsun, Jen Teh Hsiang, Tainan Hsien, Taiwan

Filed Feb. 6, 1990, Ser. No. 475,536
Int. Cl.[5] F16M 11/00
U.S. Cl. 248—188.7 2 Claims



1. A base for supporting an electric fan comprising a body having an outer periphery, a plurality of openings being formed in said outer periphery and extending inwardly thereof for receiving the inner ends of supporting feet, each of said openings including a pair of substantially parallel side walls, said openings being open at the lower ends of said side walls, each of said side walls having a pair of spaced vertically extending lips of substantially T-shaped cross-sectional configuration thereon, a plurality of supporting feet having inner and outer ends, the inner ends of each of said feet including opposite substantially parallel side surfaces, each of said side sur-

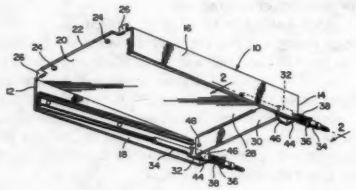
faces having a pair of spaced vertically extending grooves formed therein of substantially T-shaped cross-sectional configuration complementary to that of said lips, so that when in assembled position, each of the lips on the wall of an opening in said body fits within a groove in an associated one of said feet with the side surfaces of each of said feet firmly engaging the side walls of the associated opening, each of said feet having a vertically extending hole formed through the inner end thereof, said base having a plurality of bolt holes formed therein and opening in a downward direction, and a bolt extending through the hole in each of said feet and into the associated bolt hole in said base to securely hold the feet to the base, said base including a central hole opening in an upward direction for receiving a cooperating tube.

4,984,762

REAR DRAWER SLIDE FRAME MOUNTING SCREW WITH ADJUSTABLE POSITION COMPRESSION SPRING

Thomas F. Braun, and Manfred H. Braun, both of 250 Jackson Ave., Mineola, N.Y. 11501

Filed May 3, 1989, Ser. No. 346,631
Int. Cl.[5] E04G *3/00*
U.S. Cl. 248—216.1 **6 Claims**



1. A bracket assembly for a slidable support, said bracket assembly being adapted for support in a cabinet structure including a closed upper extremity, an upright face wall having an access opening therein terminating upwardly at a level below said upper extremity and a rear wall opposite said face wall, the upper limit of said opening being defined by an upper portion of said face wall, said bracket assembly having front and rear margins and including a pair of horizontally elongated, laterally spaced and front-to-rear extending upstanding flanges having corresponding front and rear ends, connecting means extending between and interconnecting upper marginal portions of said flanges, said front margin including means for support from said upper portion of said face wall, said rear margin including a pair of front-to rear extending sleeves, a pair of elongated front-to-rear extending pins slidably and rotatably received through said sleeves, said pins including rear ends having threaded shank means projecting endwise outwardly therefrom for threaded engagement in said rear wall and the front ends of said pins including rotary torque input means adapted to have a rotary torque tool drivingly engaged therewith, a compression spring disposed on each pin between the corresponding sleeve and threaded shank means, each pin including anchor location means spaced therealong and an anchor member selectively removably engageable with a selected anchor location means, each spring being at least slightly compressed between the corresponding anchor member and the adjacent end of the corresponding sleeve.

4,984,763

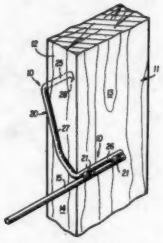
ARTICLE FOR MOUNTING OBJECTS

Patrick F. O'Donnell, 27 Main St., Andover, N.Y. 14806

Filed May 22, 1989, Ser. No. 354,567
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—218.1 **18 Claims**

1. A mounting bracket for mounting articles on a wall stud, the mounting bracket comprising:

a mounting member, the mounting member being generally U-shaped and including a first leg and a second leg extending in the same direction as the first leg and a bight joining the first leg and second leg, the first leg having a projection for penetrating a face of the vertically disposed member and the bight having a long portion extending from the first leg toward the second leg and a short portion joining the long portion at a supplementary



angle thereto of not less than about 22.5° with respect to an extended imaginary axis of the long portion and connecting the second leg to the long portion of the bight, and

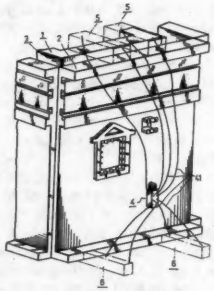
means extending beyond the bight in a direction opposite the direction of extension of the second leg and being secured in juxtaposition with the second leg for mounting articles on the mounting bracket outboard of the stud.

4,984,764

FORM WITH FORM STRIPPING MECHANISM

Yuan-Ho Lee, No. 851, Chung-San Rd., Nan-Pao Tsun, Kuei-Jen Hsian, Tainan Hsieng, Taiwan

Filed Jun. 26, 1989, Ser. No. 371,297
Int. Cl.[5] E04G *11/20*
U.S. Cl. 249—33 **6 Claims**



1. A forming device comprising:

a first form board having a first forming face, a first top end and a first bottom end;

a second form board having a second forming face, a second top end and a second bottom end, said second forming face being opposed to said first forming face to define a cavity for receiving concrete;

an upper fastening means mounted on said first and said second top ends to fasten said first and second top ends together in a spaced apart relationship to each other, said fastening means comprising a slide means to permit said first and second form boards to move away from one another or to approach one another, said slide means including a slide bar fixed to one of said first and second top sides, a support bar fixed to the other one of said first and second top sides, said slide bar and said support bar projecting in opposite directions from said first and second form boards and engaging slideably together;

an upper hydraulic drive means cooperatively connected to said slide bar and said support bar for sliding said slide bar relative to said support bar; and

a lower hydraulic drive means mounted on one of said first and second bottom ends to bear against a facing structure to move one of said form boards relative to the concrete which is formed.

4,984,765

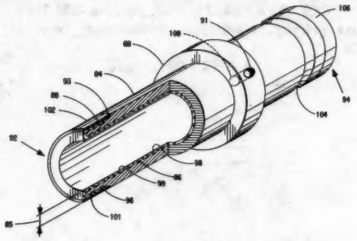
MOLD FILL COUPLING

John L. Hannon, Jr., Amherst, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 458,468, Dec. 28, 1989, Pat. No. 4,690,263. This application Apr. 26, 1990, Ser. No. 515,134

Int. Cl.[5] F16K *7/07*

U.S. Cl. 251—5 **4 Claims**



1. A pinch valve having an inlet end and an outlet end, said valve comprising:

an elongated, tubular, elastomeric sleeve, the sleeve having a turned back overlapping flange at the outlet end and a straight bore throughout;

an elongated, tubular, cylindrical housing containing the sleeve, the housing having a cylindrical cut back portion at the outlet end, the cut back portion surrounded by the overlapping flange of the sleeve;

means to seal and attach the ends of the elongated sleeve to both ends of the housing, the means for said outlet end comprising:

an adhesive between the overlapping flange and the cut back portion of the housing;

a cylindrical ring positioned at the end of the housing adjacent the cut back portion and compressively surrounding the overlapping flange of the sleeve, the ring outside diameter matching that of the housing adjacent the ring; and

means to introduce pressurized fluid between the sleeve and housing intermediate the ends of the housing, said means being adapted to permit closing and opening of said pinch valve.

4,984,766

FLOW-CONTROL VALVE

Naohiro Maeda, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

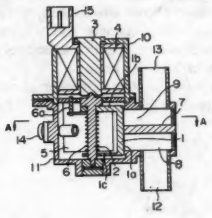
Filed Oct. 6, 1989, Ser. No. 418,217

Claims priority, application Japan, Oct. 18, 1988, 63-260470

Int. Cl.[5] F16K *31/06*

U.S. Cl. 251—129.11 **5 Claims**

1. A flow-control valve comprising a rotary valve member which is mounted eccentrically and has a valve-sheet surface formed as a partial cylindrical surface and which is adapted to perform airflow control through its rotation, and an opening which is mounted on one side of an air passage and of which a degree is controlled by said rotary valve member, a length of said valve-sheet surface of said rotary valve member in the direction in which said rotary valve rotates being larger than a length of said opening the same direction, and said valve member rotating with said valve member faced said opening over an entire range of rotation of said valve member, wherein said air passage to be controlled by said rotary valve member has two openings respectively associated with forward and backward passages arranged adjacent to each other, said two open-



ings being controlled to be opened and closed by said rotary valve member at the same opening rate.

4,984,767

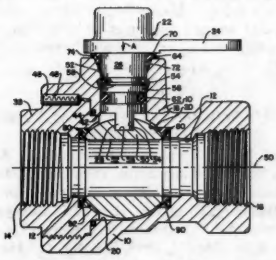
TAMPERPROOF ROTARY VALVE

Joe L. Daghe, Dubuque, Iowa; John D. Eckel, Hazel Green, Wis., and Warren G. Heidbrier, Dubuque, Iowa, assignors to A. Y. McDonald Mfg. Co., Dubuque, Iowa

Division of Ser. No. 451,146, Dec. 15, 1989. This application May 21, 1990, Ser. No. 527,000

Int. Cl.[5] F16K *51/00*

U.S. Cl. 251—297 **6 Claims**



4. A rotary valve comprising:

a valve body having a fluid flow passage extending therethrough, the passage being intersected by an actuator opening in the body and defining a valve chamber thereat;

a rotary valve disposed in the chamber for opening and closing the fluid flow passage in the valve body;

an actuator journaled in the actuator opening and coupled to the rotary valve for rotating the valve; and

torque generating means between the valve body and the actuator, including means defining an inwardly diverging mouth in the actuator opening, and a resilient grommet member at least in part biased into the mouth by a portion of the actuator in response to properly assembling the actuator in the actuator opening.

4,984,768

RETRACTABLE CHAIR

Michael A. Kolber, and Terri L. Meinking, both of 5861 SW. 76th St., South Miami, Fla. 33143

Filed Oct. 27, 1989, Ser. No. 428,184

Int. Cl.[5] A47C *4/00*

U.S. Cl. 257—16 **4 Claims**

1. An expandable and retractable chair comprised of:

a foldable chair sub frame comprised of a plurality of rectan-

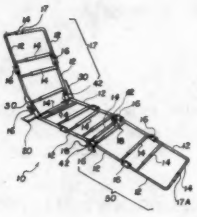
gularly interconnected transverse and longitudinal strut sub assemblies, one sub assembly hingedly connected to the other by hinge means;

leg means hingedly connected to said chair sub frame for supporting same above a support surface;

said transverse struts being selectively telescopingly extendable or retractable to thereby selectively increase or decrease the width of the chair;

wherein the transverse struts are each comprised of a pair of telescopingly slideable sleeve members having a cooperating locking means for locking said telescoping sleeve members against relative movement with each other in a first, retracted position or alternatively in a second, expanded position;

wherein said locking means is comprised of a spring biased tab adapted to be received by aligned apertures defined by said sleeve members of said transverse strut, said spring biased tab being normally biased into a position partially within said aligned apertures by a coil spring, said coil spring being located entirely within said sleeve members.



4,984,769

TAP SPOUT FOR METALLURGICAL VESSELS AND METHOD OF REPAIRING

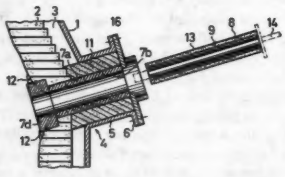
Raimund Brückner, Engenhahn-Niedernhausen; Axel Eschner, Göllheim; Wilhelm Langenfeld, Düsseldorf; Manfred Oberbach, Krefeld; Hans Rothfuss, Taunusstein, and Dieter Stüsser, Duisburg, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 26, 1989, Ser. No. 457,168

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843545

Int. Cl.[5] F27D *1/16*

U.S. Cl. 266—44 **21 Claims**



1. A method of repairing a tap spout of a metallurgical vessel for allowing molten metal to be discharged from the vessel, and which tap spout has an outer permanent lining fixed in the vessel, an inner lining and a jointing layer securing the inner lining to and within said outer permanent lining, said method comprising:

removing the inner lining and the jointing layer when worn;

providing a replacement unit comprising a tubular inner wear lining and a jointing layer secured to and surrounding said tubular inner wear lining, having a tolerance and/or characteristics that will facilitate insertion of the replacement unit within said outer permanent lining yet cause the replacement unit to be compressed therein; and

inserting the replacement unit into the outer permanent lining, after the step of removing, to secure the replacement unit under compression to and within the outer permanent lining.

4,984,770

APPARATUS FOR PARTIAL TEMPERING OF ROLLED WIRE PRODUCTS MADE OF STEEL

Samuel Balzli, Rothenburg, and Werner Syfrig, Luzern, both of Switzerland, assignors to Von Moose Stahl AG, Luzern, Switzerland

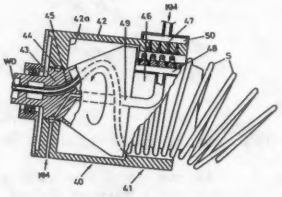
PCT No. PCT/CH87/00154, § 371 Date Jul. 22, 1988, § 102(e) Date Jul. 22, 1988, PCT Pub. No. WO88/03959, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 19, 1987, Ser. No. 236,358

Claims priority, application Switzerland, Nov. 21, 1986, 4667/86

Int. Cl.[5] C21D *9/56*

U.S. Cl. 266—106 **3 Claims**



1. An apparatus for partially tempering rolled wire products made of steel from rolling heat comprising: a tubular quenching chamber having guide elements for guiding wire in a helical motion, and delivery means for delivery of a cooling medium to at least some helical courses of the guide elements comprising grooves disposed in a tubular wall of said quenching chamber, and further comprising an annular chamber for delivering the cooling medium to the grooves at at least one grove bottom edge.

4,984,771

HEATING SYSTEM FOR STEEL CASTING LADLES

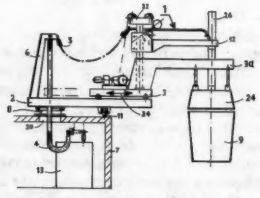
Johannes Drüppel, and Hermann Schlagböhmer, both of Oberhausen, Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nüremberg AG, Oberhausen, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,642

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446833

Int. Cl.[5] C21B *7/00*

U.S. Cl. 266—142 **5 Claims**



1. A heating system steel casting ladles, comprising a plural-

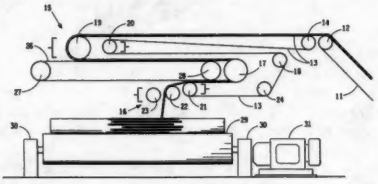
ity of steel casting ladles located at different locations along a path, the heating system for said casting ladles including a support, a swivel stage rotatably mounted on said support and a platform movable inwardly and outwardly on said swivel stage and having an outer end, an electrode supported on said outer end, a current supplying cable connected to said electrode and means guiding said cable along said platform and said stage.

4,984,772

HIGH SPEED CROSSLAPPER

Kenneth S. Freund, Hendersonville, Tenn., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 15, 1989, Ser. No. 351,918
Int. Cl.[5] B65H *29/46*
U.S. Cl. 270—30 **20 Claims**



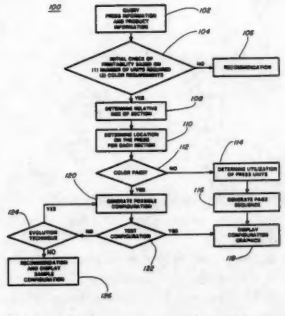
1. A crosslapper comprising:
(i) fleece feed means;
(ii) at least one endless, foraminous, fleece transporting belt for accepting fleece from the fleece feed means;
(iii) reciprocating belt carriage means for moving the fleece transporting belt continuously through the endless length of the belt and reciprocatingly in a rectilinear path; and
(iv) fleece delivery means for accepting fleece from the fleece transporting belt and moving it continuously in a rectilinear path substantially perpendicular to the path of the reciprocating belt carriage means.

4,984,773

METHOD OF AND APPARATUS FOR COMPOSING A PRESS IMPOSITION

Morton S. Balban, Skokie, Ill.; Ming-Shong Lan, and Rodney M. Panos, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1987, Ser. No. 105,159
Int. Cl.[5] B41F *13/58*
U.S. Cl. 270—5 **44 Claims**



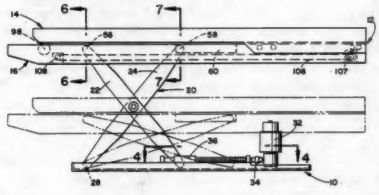
1. A sequential refinement method of composing an imposition of a printing press for printing a given edition comprised of a given number of sections, said printing press comprised of a folder assembly and an array of printing units, some disposed in front of and some in back of said folder assembly, each of said printing units having a plurality of image positions adapted to receive printing plates to print a like plurality of images onto a web and feeding it to said folder assembly, said folder assembly receiving, combining and folding a plurality of said webs into said given number of sections, said printing press having a plurality of areas, each of said areas having corresponding printing units therein, said imposition comprising an arrangement of said printing plates on selected of said image positions of selected printing units to print said given edition, said method comprising the steps of:
(a) assigning each section of said edition to one of said press areas;
(b) determining which of said printing units is available during the printing of said given edition to be utilized;
(c) examining each printing unit to determine its utilization value in terms of the relative number of said image positions which are available to receive said printing plates during the printing of said given edition with regard to the total number of said image positions for said printing unit; and
(d) constructing a list of image positions for each of said press areas and for said section assigned thereto by examining one at a time each of said printing units within said one press area in an order according to the placement of said one printing unit in said array and examining said utilization value of said one printing unit to determine whether or not to include a particular image position of said one printing unit in said list, whereby a list of said image locations is constructed in a sequence corresponding to the numerical order of said pages in said section.

4,984,774

PATIENT SUPPORT COUCH ASSEMBLY

Anton Z. Zupancic, Kirtland; Anthony A. Champa, Euclid, and John L. Dobbs, Broadview Heights, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Filed Nov. 25, 1988, Ser. No. 276,287
Int. Cl.[5] A61G *13/00*
U.S. Cl. 269—322 **19 Claims**



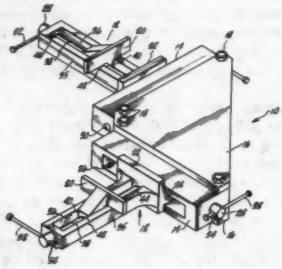
1. A medical diagnostic couch assembly for a patient undergoing medical diagnosis, comprising:
a couch on which the patient reclines said couch including a depending rail cover wall;
a subframe for slidably supporting said couch, said subframe including longitudinally extending slot, and a pair of parallel vertically spaced hard metal wear strips, one secured to a respective top and bottom surface of the slot wherein said rail cover wall encloses said slot to retard the deposition of dirt and grime therein, said couch further including at least one roller rotatably mounted to said rail cover wall and extending inwardly therefrom so as to extend into said slot and between said pair of wear strips;
a scissors structure for supporting said subframe, said scissors structure comprising a first leg and a second leg, each of said legs being pivotably secured at a first end to said base and at a second end to said subframe, said two legs also being secured to each other intermediate said first and second ends thereof; and,
a means for selectively pivoting said scissors structure.

4,984,775

CORNER CLAMP ASSEMBLY

Robert J. Kahlke, 2434 Alvarado Dr., Santa Clara, Calif. 95051

Filed Mar. 31, 1989, Ser. No. 331,708
Int. Cl.[5] B25B *1/20*
U.S. Cl. 269—41 6 Claims



1. A corner clamp assembly comprising:

including a first and a second frame member, a first end of each of said frame members being joined to each other by a first pivotal connection,

first and second bracket members, each of said bracket members having first and second ends, the first end of each of said bracket members being joined to each other by a second pivotal connection, the second end of said first frame member and the second end of said second bracket being joined to each other by a third pivotal connection, the second end of said second frame member and the second end of said second bracket being joined to each other by a fourth pivotal connection, such that a first angle of said L-shaped frame in a first plane can be varied and fixed by securing means, associated with said first through fourth pivotal connections,

first and second legs, said first leg pivotally mounted onto said first frame member creating a degree of freedom in a second plane orthogonal to said first plane and said second leg pivotally mounted onto said second frame member creating a degree of freedom in a third plane orthogonal to said first plane,

first and second clamping means, said first clamping means mounted on and extending substantially perpendicular to said first leg and said second clamping means mounted on and extending substantially perpendicular to said second leg, both of said first and second said clamping means being slidably movable along the length of the one of said legs to which it is mounted by a first adjusting means, said first and second clamping means having a clamping force which can be varied by a second adjusting means,

pivoting means, connected to one of said frame members and to said first and second legs, for pivoting and fixing said first and second legs at a second angle to said first plane in said second and third planes respectively, said second angle controlled by a third adjusting means.

4,984,776

END ATTACHMENT ASSEMBLY FOR A TWISTED ROPE TORSION BAR

Jack E. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

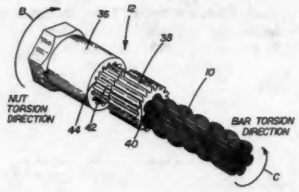
Filed Aug. 7, 1989, Ser. No. 390,301
Int. Cl.[5] F16F *1/16*
U.S. Cl. 267—276 3 Claims

1. An end attachment assembly in combination with a twisted rope torsion bar having a helical surface that reduces in diameter as torque is applied, comprising:

an anchor nut connecting to a mounting means for a sprung mass, said anchor nut including a bore having internal cam splines biased strongly in only one direction relative to the twist of said twisted rope torsion bar; and

means for attaching said anchor nut to said twisted rope torsion bar, including an internal elastomeric bushing integrally molded to an annular portion of the helical surface on one end of said twisted rope torsion bar;

said elastomeric bushing having external cam splines biased strongly in only said one direction and mating with said internal splines of the bore of said anchor nut so as to



compress said twisted rope torsion bar only when torque is applied to said anchor nut in the direction of the bias of said cam splines;

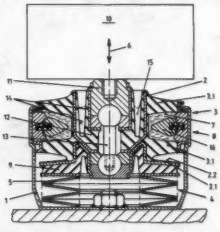
whereby a tight grip is continuously maintained between said end attachment and said twisted rope torsion bar to reduce the stress concentration at the attachment helical surface interface as the diameter reduces and prevent separation of said attachment assembly from said torsion bar.

4,984,777

FLEXIBLE BEARING WITH A DISK SPRING HAVING AN S-SHAPED SPRING CONSTANT CURVE

Klaus Kurr, Weinheim; Hans-Gerd Eckel; Heinz Seifert, both of Laudenbach; Werner Idigkeit, Weinheim, and Armin Barth, Gorxheimertal, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstrasse, Fed. Rep. of Germany

Filed Nov. 27, 1989, Ser. No. 441,378
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1988, 3840156
Int. Cl.[5] B60K *5/12*; F16F *13/00*
U.S. Cl. 267—140.1 19 Claims



1. A flexible bearing for supporting a body comprising:

a journal bearing having means for attachment to a supporting foundation;

a support having means for attachment to a body to be supported by the flexible bearing;

an elastic spring connected between the journal bearing and the support, said elastic spring having a first load carrying capacity; and

a bearing spring made of a non-creeping material connected between the journal bearing and the support in parallel with the elastic spring, said bearing spring comprises at

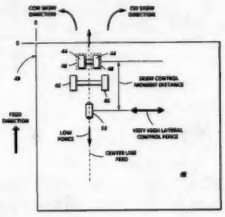
least one disk spring having an S-shaped spring constant curve and a second load carrying capacity, said second load carrying capacity being defined relative to said first load carrying capacity such that, after the weight of a body to be supported is applied to the flexible bearing, said at least one disk spring has an essentially zero spring rate and the elastic spring is essentially free of elastic tensions.

4,984,778

SHEET FEEDER WITH SKEW CONTROL

Thomas R. Alexander; Donato D. Evangelista, both of Webster, and Michael F. Leo, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 23, 1989, Ser. No. 327,635
Int. Cl.[5] B65H *3/06*
U.S. Cl. 271—117 **20 Claims**



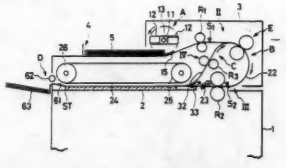
1. Apparatus for feeding sheets comprising a surface over which a sheet may be fed, means for feeding sheets over said surface, said feeding means having a centerline of feed parallel to the direction of sheet feeding and at least one means to inhibit skewing of a sheet being fed by said feed means over said surface comprising an idler roll mounted for rotational contact with a sheet being fed on the centerline of the feed means whereby a torque is not imparted to a sheet being fed in either the clockwise or counterclockwise direction when the feed means imparts no torque to a sheet being fed, said idler roll having a high frictional contact surface and being mounted to provide a low drag force in the feeding direction and a high lateral drag force to inhibit a sheet being fed from skewing.

4,984,779

AUTOMATIC DOCUMENT CONVEYING DEVICE FOR ORIGINAL IN A TWO-SIDED COPY MACHINE

Yasuo Iwasaki, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1988, Ser. No. 146,181
Claims priority, application Japan, Feb. 6, 1987, 62-024712; Feb. 12, 1987, 62-028177
Int. Cl.[5] B65H *7/10*
U.S. Cl. 271—227 **24 Claims**



1. An automatic document conveying device for use in a machine for copying both sides of duplex original documents comprising:

an original document feeder means for serially feeding one-side and both-side original documents;

a platen having an original copying position including a side edge;

a substantially U-shaped first conveyance means for conveying an original document to said original copying position;

a second conveyance means for removing from said platen an original document positioned at said original copying position, for inverting said removed original document responsive to the copying of one side thereof, and for conveying said inverted original document to said original copying position; and

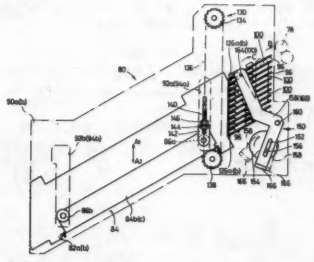
at least one side edge position aligning means for aligning a side edge of each original document conveyed by said first conveyance means and said second conveyance means with said side edge of said document at said original copying position, wherein said first conveyance means and said second conveyance means includes a common conveyance portion, and wherein said side edge position aligning means is provided in said common conveyance portion.

4,984,780

STACKER FOR STIMULABLE PHOSPHOR SHEETS

Yuuji Saito, and Makoto Ogoda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1989, Ser. No. 325,261
Claims priority, application Japan, Mar. 18, 1988, 63-65057
Int. Cl.[5] B65H *39/11*
U.S. Cl. 271—292 **14 Claims**



1. A stacker for storing a plurality of stimulable phosphor sheets, comprising:

a sheet storage assembly having a plurality of stock plates defining a plurality of sheet bins for storing the stimulable phosphor sheets respectively therein;

holder members holding said sheet storage assembly;

displacing means for selecting one of said sheet bins and relatively bringing the selected sheet bin into confronting relation to a sheet feed means; and

said stock plates having respective selective displacing means for selectively moving a desired stock plate toward said sheet feed means after said selected sheet bin is brought into confronting relation to said sheet feed means.

4,984,781

Patent Not Issued For This Number

4,984,782

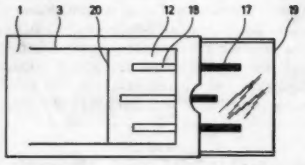
MAGIC CARD

Walther Rüger, Munich, Fed. Rep. of Germany, assignor to Refeka Werbemittel GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 3, 1990, Ser. No. 503,984
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1989, 8904156[U]
Int. Cl.[5] A63T *21/00*
U.S. Cl. 272—8 R **18 Claims**

1. A magic card formed of blanks and provided with a cover and with a slide member, which is guided in said cover and which is adapted to be pulled out of said cover at least partially, said cover having a front wall (1) and a rear wall (2) as well as an insertion opening on one side thereof and said slide

member having two slide member surfaces (12, 13), which are placed one on top of the other and which are interconnected on one side thereof, one of said slide member surfaces (12) being transparent and the other slide member surface (13) constituting a picture area, characterized in that the cover consists of a single blank (11), said rear wall (2) and said front



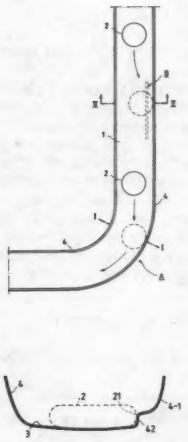
wall (1) being folded towards each other about a common folding line (5) and said front wall (1) being provided with a cut (3) by means of which a window as well as a tongue (4), which is adapted to be slipped between the two slide member surfaces (12, 13), are formed, said tongue (4) covering the picture area (13) of the slide member and constituting a picture area itself.

4,984,783

WATER SLIDERS WITH TURNING TOBOGGANS

Yoko Fujimaki, Shizuoka, Japan, assignor to Shiratori Co. Ltd., Shizuoka, Japan

Filed Oct. 20, 1989, Ser. No. 424,709
Int. Cl.[5] A63G *3/00*
U.S. Cl. 272—565 R **2 Claims**



1. A water slider used with a round or substantially round tobogganing boat designed to be displaced into contact with one side thereof in the course of tobogganing,

said water slider comprising opposing side walls and a connecting slide surface,

a side wall of said slide lane which contacts said boat having a substantially vertical portion which contacts a side or side edge of said boat, thereby increasing the friction between said side wall and said boat to substantially or completely eliminate any relative slippage between said boat and said side wall,

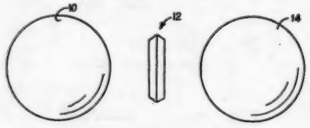
said water slider including a curved portion having a slide face formed into a substantially flat plane which causes said boat to slide down in a substantially linear direction, while at the same time being displaced to one side of said water slider into contact with said side wall.

4,984,784

APPARATUS FOR EXERCISING AND CONDITIONING A HAND

Arthur Bailey, 30730 Duff Rd., Walker, La. 70785

Continuation-in-part of Ser. No. 242,876, Sep. 12, 1988, abandoned. This application Mar. 9, 1990, Ser. No. 491,243
Int. Cl.[5] A63B *37/00*; A61H *1/02*
U.S. Cl. 272—67 **1 Claim**



1. A three part apparatus adapted to be completely held in one hand of the user for exercising and conditioning the hand of the user comprising, in combination:

a. a first metal sphere,

b. a second metal sphere, and

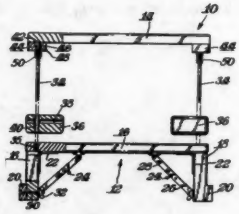
c. a pivot ring positioned between, and touching, said first and said second spheres, said pivot ring being generally circular in shape and having a hole in the center thereof for receipt of a portion of each of said spheres, said pivot ring having two parallel forces which are perpendicular to the central longitudinal axis of said pivot ring, said pivot ring having a magnet therein which has sufficient magnetic force to hold said pivot ring to said first or said second sphere.

4,984,785

DEVICE FOR SIMULATING CLIMBING

William T. Wilkinson, Rte. 4, Box 205, Seaford, Del. 19973

Filed Sep. 18, 1989, Ser. No. 408,925
Int. Cl.[5] A63B *21/12*
U.S. Cl. 272—70 **7 Claims**



1. A device for simulation of climbing comprising a support unit, said support unit having a plurality of legs, a base secured to the top of said legs whereby said base may selectively function as a lowermost step on to which and from which a user may step during a simulated climbing exercise, a platform selectively disposed above and detachably connected to said base to provide an alternate step, and at least one spacer being selectively disposed between and detachably connected to said base and said platform for varying the distance said platform extends above said base to thereby permit the user to selec-

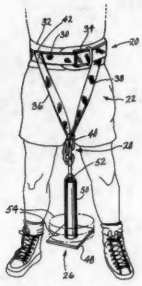
tively adjust the height of the step; a plurality of said spacers being selectively positioned between said platform and said base, said spacers each having different horizontal and vertical dimensions and selectively mounted in one of two positions between said platform and said base, wherein a first hole extends through said horizontal dimension of said spacer and a second hole extends through said vertical dimension of said spacer, and a pin being mounted between said base and said platform and selectively extending through one of said holes of said spacer.

4,984,786

WEIGHT SUSPENSION APPARATUS FOR SQUAT EXERCISES

William E. Lemke, 2022 E. Marion St., Shorewood, Wis. 53211, and Gregory G. Reshell, 1121 E. Hamilton St., Milwaukee, Wis. 53202

Filed Nov. 14, 1989, Ser. No. 436,371
Int. Cl.[5] A63B *21/65*
U.S. Cl. 272—119 **10 Claims**



10. A weight suspension apparatus for squat exercises, comprising:

a belt;

securing means for firmly securing said belt about the waist of a user;

a front V-shaped strap having its nadir located between the user's legs and its upper ends connected to said belt such that each upper end is disposed closely adjacent and forwardly of the user's greater trochanter on either side of the user;

a rear V-shaped strap having its nadir located between the user's legs and its upper ends connected to said belt closely adjacent the upper ends of said front V-shaped strap means such that each upper end is disposed closely adjacent and rearwardly of the user's greater trochanter on either side of the user;

so that, on either side of the user's body, an upper end of said front strap and an upper end of said rear strap are located closely adjacent each other; and

weight attachment means for securing a weight to be lifted to said front and rear straps, comprising a weight connection member spanning between said front and rear straps and connected at the nadir of each; means for attaching the weight to be lifted to said weight connection member; and means for providing frontward and rearward movement of said attaching means to varying locations along said weight connection member.

4,984,787

ILLUMINATED BASKETBALL BASKET RIM AND ILLUMINATED BASKETBALL BACKBOARD

Charles E. Nesbit, 9206 Willard Ct., Des Moines, Iowa 50322, and Mark S. Nesbit, 1248 17th, West Des Moines, Iowa 50265

Continuation of Ser. No. 327,597, Mar. 23, 1989. This application Mar. 30, 1990, Ser. No. 501,680
Int. Cl.[5] A63B *63/08*
U.S. Cl. 273—1.5 R **6 Claims**

1. In a basketball backboard and basketball rim combination an improvement comprising:

an illumination means in the form of illumination lights contained within both the basketball rim and portions of the basketball backboard wherein both said rim and backboard are provided with transparent surfaces that will permit the transmission of light from the said illumination lights; and

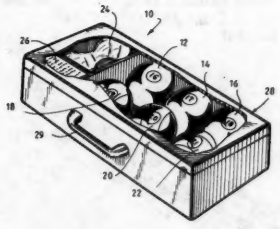
switching means for controlling the on/off actuation of said illumination lights; wherein, the switching means includes pressure sensitive means located on the face of the backboard for controlling the on/off actuation of said illumination lights.

4,984,788

POOL GAMES APPARATUS

Paul W. Harriman, 34 Pinecrest La., Dover, N.H. 03820

Filed Feb. 20, 1990, Ser. No. 482,154
Int. Cl.[5] A63D *15/00*
U.S. Cl. 273—22 **9 Claims**



1. Apparatus for playing pool games, comprising:

(a) six original balls to be used by each player of a plurality of players to play a plurality of pool games;

(b) three minute time glass for timing each said player;

(c) instruction manual for playing said plurality of pool games that can be found in said instruction manual; and

(d) a carry case containing said six balls, said three minute time glass, and said instruction manual.

4,984,789

ARM AND ELBOW ELEVATOR HARNESS

Roger D. Socci, 11720 Newbridge Ct., Reston, Va. 22091

Filed May 15, 1989, Ser. No. 352,166
Int. Cl.[5] A63B 69/00
U.S. Cl. 273—26 C 2 Claims

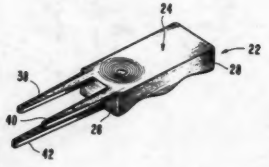
1. A pitcher's training device for training baseball pitchers the correct arm and elbow action when pitching a baseball comprising: an arm elevator harness which fits around the pitcher's upper body; an arm and elbow elevator guide connected to said harness at a position under the pitcher's throwing arm in a manner to allow for movement of the arm and elbow elevator guide in an elyptical fashion, said arm and elbow elevator guide comprising a first outer portion which contacts and guide said pitching arm and a second inner portion movably attached to the harness and said outer portion being connected to said inner portion by a spring hinge mechanism for pivotally biasing said outer portion away from said inner portion and to an arm supporting position, means for releasably holding said outer portion in an inactive position whereby said outer portion is held substantially parallel to said inner portion, said releasably holding means releasing said outer portion when contacted by a pitcher's arm at the start of movement of the arm when a pitcher moves his arm in a proper ball pitching motion.

4,984,790

BALL MARK REPAIR TOOL

John C. Dowdy, 419 Pleasant Hill Dr., Richmond, Va. 23236, and Sheldon C. Drake, 3800 Pheasant Hollow Dr., Richmond, Va. 23231

Filed Mar. 22, 1990, Ser. No. 497,304
Int. Cl.[5] A63B 57/00
U.S. Cl. 273—32 B 9 Claims



1. A ball mark repair tool of a size capable of being carried in a golfer's pocket comprising:

a body adapted to be held in and manipulated by the hand; and

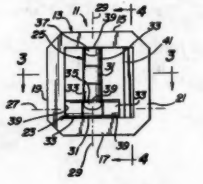
at least two prongs disposed in substantially the same first plane and at least one prong disposed in a second plane spaced from said first plane and said prongs extending outwardly from the body and adapted to be inserted in the ground under a ball mark and used to lift the depression of said ball mark.

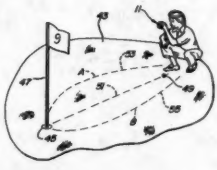
4,984,791

GREEN INCLINATION LEVEL FOR GOLFERS

Larry Labell, 1100 N. Alta Loma Rd., Suite 502, Los Angeles, Calif. 90069

Filed Oct. 2, 1989, Ser. No. 416,995
Int. Cl.[5] A63B 57/00
U.S. Cl. 273—32 H 8 Claims





4. A new article of manufacture, namely a green inclination level for golfers using a putter on a green having a cup, comprising a hollow frame having opposed top, bottom and side walls;

a pair of coplanar right angularly related first and second float levels within said frame secured together and connected to said frame;

each float level having a longitudinal axis and a central index and outer index spaced upon opposite sides of the central index and a bubble movable relative to said axis; and

an elongated sighting rod secured within said frame between its top and bottom and parallel to and spaced from said second float level and one side wall;

said frame being adapted for orienting to a first upright plane at the user's eye level for visually aligning the sighting rod, a golf ball and a cup upon a golf green, providing a line of sight, said first upright plane being at right angles to said line of sight;

said frame being further adapted for a limited rotation in said plane until the axis of said first level is in parallel registry with the green adjacent said cup;

the position of the bubble in said first level in relation to said central and outer indexes indicating the extent and direction of slant of said green to said cup;

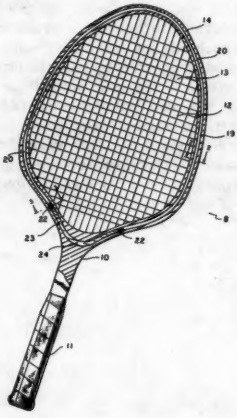
the golfer relying upon said bubble position as designating a golf ball stroking path for a putter with such stroking force as will assure a curved path of travel of the golf ball into the cup.

4,984,792

WEIGHTED TENNIS/RACQUETBALL RACKET

Jan Pacanski, 38 Goodwin St., Bristol, Conn. 06010

Filed Jun. 11, 1987, Ser. No. 60,485
Int. Cl.[5] A63B *49/02*
U.S. Cl. 273—73 C 2 Claims



1. In a weighted racket for tennis or racketball provided with a frame having a base joined to a handle and including a net spanning an open area defined by the frame, the improvement comprising;

an endless continuous conduit disposed fully within said frame and frame base and encircling said open area,

fluid restricting means within said conduit symmetrically disposed relative to a longitudinal axis extending through said handle and adapted to regulate the flow of liquid from one side of said fluid restricting means to the other side,

said fluid restricting means comprising a pair of spaced apart valve elements each having a reduced diameter bore disposed within said conduit and defining upper and lower chambers within said conduit respectively within said frame and base with said upper and lower chambers on opposite sides of said valve elements, and

a liquid partially filling said conduit whereby,

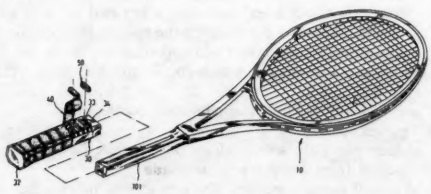
swinging of said racket produces a restricted displacement of said liquid between said chambers in said base and frame as said liquid passes through said valve elements.

4,984,793

RACKET HANDLE CAP

Dennis C. Chen, 9-1, Lane 161, Hsing An Road Sec. 1, Taichung, Taiwan

Filed Sep. 5, 1989, Ser. No. 402,889
Int. Cl.[5] A63B *49/08*
U.S. Cl. 273—75 1 Claim



1. A racket handle cap which is single piece injection molded and made of pliant materials such as thermoplastic rubber in the range of Shore A Hardness about 55 to 60, comprising: an opening at one end elongately extending along a grip portion to a flaring section to define an internal cavity, a plastic end plate, an adhesive tape and a plurality of counter weights;

said internal cavity of said opening being substantially equal to the size of the handle part of a racket frame for permitting said racket handle cap inserting thereover;

said grip portion having a plurality of oval air circulation vents and circular air circulation vents being respectively formed thereon in rows for eliminating the air therethrough by inserting the handle part of a racket frame within said internal cavity;

said counter weights respectively conforming in shape with said oval and circular air circulation vents for defining their optional and removal insertion into said oval and circular air circulation vents, the weight adjustment and distribution of said racket handle cap being achieved;

said plastic end plate having an elasticity greater than said racket handle cap in Shore Hardness A for being engaged within said flaring section, ensuring a comfortable grip;

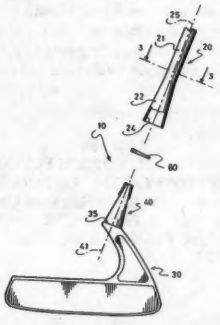
said adhesive tape being provided for wrapping over and attaching to sasid racket handle cap and securing said counter weights to said oval and circular air circulation vents of said grip portion.

4,984,794

GOLF CLUB CAPABLE OF SELECTIVE ANGLE MODIFICATION BETWEEN THE SHAFT AND HEAD, AND METHOD OF ASSEMBLING THE GOLF CLUB

Andre Pernelle, Seynod, and Jack Desbiolles, Annecy, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed May 2, 1989, Ser. No. 346,557
Claims priority, application France, May 2, 1988, 88 06187
Int. Cl.[5] A63B *53/02*
U.S. Cl. 273—80.1 32 Claims



1. A golf club comprising:

(a) a shaft having a means for supporting a head, said supporting means being rigidly affixed to said shaft;

(b) a head for attachment to said shaft, said head having means for engaging said supporting means of said shaft and further comprising a neck;

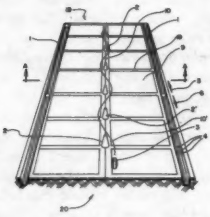
wherein said supporting means of said shaft and said engaging means of said head comprise a plurality of projections on one of said supporting means and said engaging means and further comprise means for selectively positioning a first single longitudinal axis passing through said shaft at one of a plurality of predetermined angles relative to a second longitudinal axis passing through said neck as said shaft and said head are attached.

4,984,795

SURFACE PROJECTILE GAME WITH ZIG-ZAG BALL

Zoran Bozinovic, Bulevar JNA 105, 11000 Belgrade, Yugoslavia

Filed Feb. 15, 1989, Ser. No. 311,614
Claims priority, application Yugoslavia, Feb. 17, 1988, 309/88
Int. Cl.[5] A63F 3/00
U.S. Cl. 273—126 R 3 Claims



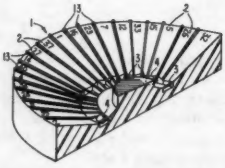
1. A surface projectile game apparatus comprising a game board having a substantially flat playing surface of about 1.5 m in width and about 20 m in length, said playing surface having a longitudinal center line and a plurality of spaced apart lines extending transversely across said playing surface and intersecting said center lines to define a plurality of discrete areas on said playing surface, a plurality of barriers, each said barrier being placed along said center line at a said intersection, means defining a channel along opposite longitudinal sides of said playing surface, each said channel having three spaced apart shafts placed therein, said shafts sloping downwards from the longitudinal mid-point of said game board to opposite ends thereof, two of said shafts lying in an inclined plane and the third shaft being below and intermediate said two shafts, a ball, said ball having means therein for causing said ball to roll along a substantially sinusoidal path when rolled over said playing surface whereby when said ball is rolled along said center line will alternately pass between a pair of said barriers as it progresses from one end towards the other end of said playing surface, said ball when improperly pushed by a player will fall into a said channel, rest upon said shafts and return to one end of said game board.

4,984,796

DEVICE AND METHOD FOR SELECTING RANDOM NUMBERS FOR PLAYING LOTTERY GAMES

Lawrence L. Peacock, 7510 Salem Rd., Falls Church, Va. 22043

Filed May 22, 1989, Ser. No. 354,711
Int. Cl.[5] A63F 5/02, 3/06
U.S. Cl. 273—142 E 1 Claim



1. A device for selecting a plurality of numbers for an entry in a game of chance such as a lottery game wherein the entry comprises a subset of numbers chosen from a field of numbers, the field of numbers comprising a set of numbers which are selectable in the lottery game, said device comprising:

a wheel having a plurality of rest positions for balls, each said rest position having a distinct number associated therewith, the distinct numbers forming the set of numbers which are selectable in a lottery game;

a plurality of balls, the number of balls corresponding to the quantity of numbers to be selected in said lottery game to form said subset;

means for causing each of said balls to assume one of said rest positions, whereby a distinct number is selected for each ball according to the number associated with the rest position of each ball and said lottery entry comprises the subset of numbers selected by said plurality of balls;

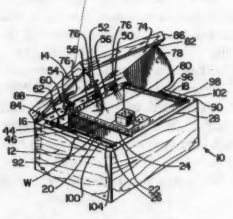
said wheel further including a plurality of pockets, said pockets defining said rest positions, and wherein said pockets are triangular, said triangular pockets each having a base wherein bases of a plurality of said triangular pockets face toward the center of the wheel and the remaining triangular pockets have bases facing toward the outer periphery of said wheel.

4,984,797

GAME BOX

John A. Norsworthy, 677 Laverendrye Drive, Gloucester, Ontario, K1J 7X5, Canada

Filed Jun. 26, 1989, Ser. No. 371,534
Claims priority, application Canada, Dec. 21, 1988, 586630
Int. Cl.[5] A63F 9/04
U.S. Cl. 273—145 C 16 Claims



1. A game apparatus comprising:

a container and al id therefor; said lid moveable between an open and a closed position; said container having therein a shaker section and a shelf section; said shelf section substantially isolated from said shaker section when said lid is in said closed position on said container and having a bottom which is spaced a predetermined distance from the top of said container such that, when said lid is in said closed position, a die lying on the said shelf is restrained against movement when said apparatus is shaken; and

an integral illumination system for illuminating the interior of said container;

and wherein said illumination system comprises:

a power source;

at least one light source electrically connected to receive power from said power source; and

an on/off switch mounted to be activated by moving said lid between said open and closed positions and connected electrically to control current flow between said power source and said light source.

4,984,798

COMPOSING PLANE FOR TWO-SIDED PUZZLES

Beniamino Silberstein, Via Laviano, Parco Spazio - 81100 Caserta, Italy

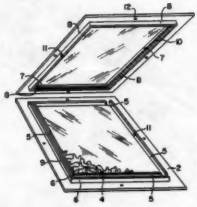
PCT No. PCT/IT89/00012, § 371 Date Oct. 30, 1989, § 102(e) Date Oct. 30, 1989, PCT Pub. No. WO89/08485, PCT Pub. Date Sep. 21, 1989

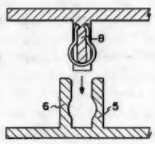
PCT Filed Mar. 7, 1989, Ser. No. 434,686

Claims priority, application Italy, Mar. 8, 1988, 35579/88[U]

Int. Cl.[5] A63F *9/10*; B65D *6/00*

U.S. Cl. 273—157 R 3 Claims





1. A composing plane for containing the playing pieces of a two-sided puzzle, comprising:

first and second planar sheets; each sheet having a generally rectangular four-sided configuration and formed from a transparent material;

first longitudinal sidewall means provided on one surface of each of said first and said second sheets for containing the pieces of the puzzle; said first longitudinal sidewall means formed generally along and spaced inwardly from the perimeter of at least two sides of each of said first and said second sheets;

second longitudinal sidewall means spaced from and extending generally in a direction parallel to said first longitudinal sidewall means along at least two contiguous sides on the surface of each of said first and said second sheets;

said first longitudinal sidewall means and said second longitudinal sidewall means forming a continuous elongated cavity on the surface of at least one of said first and said second sheets for providing complimentary engagement with the first longitudinal sidewall means located on at least the other of said first and said second sheets;

spring means for fastening said first and said second sheets in a closed position; and

at least one through hole for engagement with a supporting member for displaying said composing plane; said through hole being provided at a point proximate the outer perimeter of at least one of the sides on each of said first and said second sheets.

4,984,799

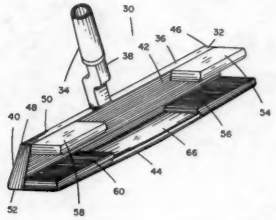
GOLF CLUBHEAD WITH A CORNER-BACK SYSTEM OF WEIGHT DISTRIBUTION

Clifton D. Finney, 4057 Oak Hills Pkwy., Baton Rouge, La. 70810

Filed Sep. 28, 1989, Ser. No. 413,632

Int. Cl.[5] A63B *53/04*

U.S. Cl. 273—169 20 Claims



1. A golf clubhead comprising:

a. a body of a predetermined lower density;

b. a head weight means comprising at least one head weight serving as inertial weight for said clubhead whereby each said head weight is of a predetermined higher density greater than said predetermined lower density of said body; p1 c. a toe and a heel, a front and a back, and a top and a sole with a ball striking surface toward said front;

d. a binding means to attach said head weight means to said clubhead;

e. a fastening means to affix a shaft between said heel and said toe;

g. a toe section of said clubhead extending one-half the length of said clubhead from an extreme of said toe toward said heel to a central boundary defined by a vertical cut-plane positioned perpendicularly to the length line of said clubhead;

h. a toe weight means comprising at least one toe weight of the portion of said head weight means in said toe section serving as inertial weight for said toe section;

i. a modified toe weight distribution to position between said ball striking surface toward said front and said back:

(i) a first substantial percentage of said toe weight means as an increased upper concentration of mass in a predetermined fixed upper location adjacent said top and said toe, and a second substantial percentage of said toe weight means as an increased lower concentration of mass in a predetermined fixed lower location adjacent said sole and said toe;

(ii) a middle volume directly between said increased upper and lower concentrations of mass having a decreased middle concentration of said toe weight means substantially less concentrated than each of said increased upper and lower concentrations to substantially separate said increased upper concentration from said increased lower concentration; and

(iii) an upper central volume directly between said increased upper concentration and said central boundary of said toe section having a decreased upper central concentration of said toe weight means substantially less concentrated than said increased upper concentration tending to separate said increased upper concentration from said central boundary; whereby

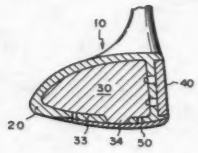
j. polar moments of inertia of said clubhead are enhanced.

4,984,800

HEAD OF GOLF CLUB AND METHOD OF PRODUCING THE SAME

Jiro Hamada, Noda, Japan, assignor to Hamada Enterprise & Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 280,676, Dec. 6, 1988, abandoned. This application Feb. 22, 1990, Ser. No. 484,000
Claims priority, application Japan, Sep. 30, 1988, 63-246537
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—173 12 Claims



1. A head of a golf club comprising: a core made of a foamed material;

a face attached to said core; at least one of said core and said face having means for retaining a spaced apart constant juxtaposition with each other;

a shell molded over said core with said face attached thereto; and

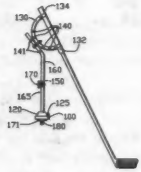
a sole plate attached to a lower surface of the head.

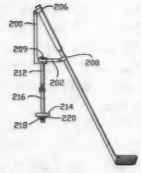
4,984,801

GOLF SWING MUSCLE STRENGTHENER AND SWING DEVELOPER DEVICE

James A. DeBack, 3443 Baywood Cir., Antoich, Calif. 94509

Filed Jan. 11, 1990, Ser. No. 463,552
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186 A 28 Claims





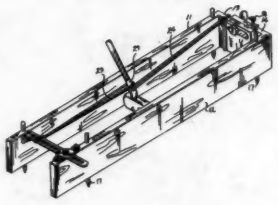
1. A combination comprising a golf club having an elongated shaft having an upper and lower end, a handle portion having two ends, the handle portion located at the upper end of the shaft, a club head at the lower end of the shaft and a golf swing muscle strengthener and swing developer device, said device including at least one weight; a structural member adjustablely connected to the handle portion; means for connecting the structural member to the club; said structural member extending from the handle portion of the golf club to a position directly below where a golfer grips the club; the weight insertable over the lower end of the structural member so that the weight is directly below a golfer's hands while the golfer swings the club head square to a swing line; a first removable means for retaining the weight, said first removable retaining means located below the weight.

4,984,802

GOLF PUTTING STROKE TRAINER APPARATUS

Chet Barraclough, 1271 Poplar Ave., #102-D, Sunnyvale, Calif. 94086

Filed Mar. 26, 1990, Ser. No. 500,537
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—192 5 Claims



1. A golf putting stroke trainer apparatus comprising,

a "U" shaped housing including a first longitudinal rigid side spaced from and parallel to a second longitudinal rigid side, the first rigid side including a first interior surface and a first exterior surface, and the second side including a second interior surface and a second exterior surface, wherein the first and second interior surfaces are arranged in confronting parallel relationship relative to one another and defined by a predetermined height, and

the first and second sides each including a respective first and second rear terminal end, the first rear terminal end including a first end leg rigidly mounted thereto, and the second rear terminal end including a second end leg rigidly mounted thereto, wherein the first and second end legs are adjustably mounted relative to one another, and the first and second sides including a respective first and second forward terminal end, the first and second terminal ends each including a respective first and second alignment member, wherein the first and second alignment members are adjustable relative to one another to align the first and second forward terminal ends relative to one another, and

wherein the first and second end legs are orthogonally mounted to the respective first and second rear terminal ends of the respective first and second sides, and

wherein the first end leg includes a first slot longitudinally aligned with the first end leg and the second end leg includes a second slot longitudinally aligned with the second end leg, and wherein the first and second slots are in an aligned overlying relationship relative to one another, and the first and second end legs are arranged in a contiguous sliding relationship relative to one another, and a clamp member is directed through the first and second slots to selectively clamp the first end leg relative to the second end leg.

4,984,803

GOLF BALL COVER COMPOSITION

Francisco M. Llort, Arlington, Tex., and Manuel R. Jerome, Jr., New Bedford, Mass., assignors to Acushnet Company, New Bedford, Mass.

Filed Oct. 11, 1989, Ser. No. 419,646
Int. Cl.[5] A63B *37/12*
U.S. Cl. 273—235 R 7 Claims

1. A golf ball comprising a core and a cover wherein the cover is formed from a composition comprising about 70 to

about 95 phr of balata and about 5 to about 30 phr of cis 1,4 polybutadiene having a cis 1,4 content of greater than 40%.

4,984,804

GOLF BALL

Mikio Yamada, Kobe, and Yoshinobu Nakamura, Nishinomiya, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Oct. 5, 1989, Ser. No. 417,302
Claims priority, application Japan, Oct. 17, 1988, 63-262290
Int. Cl.[5] A63B *37/12*
U.S. Cl. 273—235 R **17 Claims**

1. A golf ball comprising a core and a cover covering said core, wherein said cover has a melt index of 0.5 to 3.0 and a Shore D hardness of at least 65, and is prepared by mixing

(A) an ionomer resin having a melt index of 0.5 to 5.0 and a Shore D hardness of at least 65, prepared from an ethylene-methacrylic acid copolymer containing 10 to 20% by weight of methacrylic acid with the balance ethylene of which 20 to 70 mol % of the carboxyl groups is neutralized with sodium ions,

(B) an ionomer resin having a melt index of 0.5 to 3.0 and a Shore D harness of at least 65, prepared from said eithylene-methacrylic acid copolymer of which 40 to 70 mol % of the carboxyl groups is neutralized with zinc ions or magnesium ions, and

(C) an ionomer resin having a melt index of 0.1 to 2.0 and a Shore D hardness of at least 65, prepared from said ethylene-methacrylic acid copolymer of which 10 to 50 mol % of the carboxyl groups is neutralized with sodium ions and 10 to 50 mol % of the carboxyl groups is neutralized with zinc ions or magnesium ions,

in an amount ratio sufficient to meet the following relationships;

$$30 \leqq A \leqq 60$$

$$10 \leqq B \leqq 50$$

$$5 \leqq C \leqq 40$$

$$A + B + C = 100(\%\text{ by weight}).$$

4,984,805

EDUCATIONAL BOARD GAME AND METHOD OF PLAYING THE SAME

Nancy P. Medlock, 2647 N. 22nd St., Kansas City, Kans. 66104

Filed Jan. 26, 1990, Ser. No. 470,694
Int. Cl.[5] A63F *3/00, 9/18*
U.S. Cl. 273—248 **10 Claims**

3. An educational game comprising:

(a) a game board having a playing surface including:

structure defining a plurality of sides, for positioning a plurality of different questioned players,

structure defining an end for positioning of a game master and a master area juxtaposed thereto,

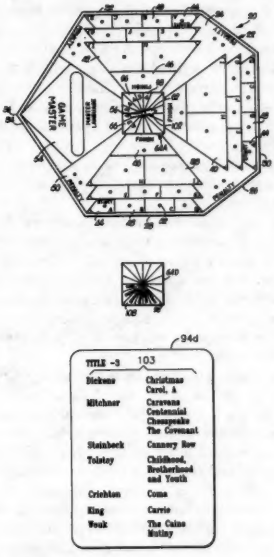
a plurality of individual paths corresponding to each questioned player defined on said surface, each path including a start area, a finish area, and a plurality of intermediate areas;

(b) question-selector means including a face presenting a plurality of different question category spaces and indicator means for randomly selecting one of said category spaces;

(c) a set of question and answer cards, each of said cards including a plurality of mated question and answer pairs, at least one of said pairs corresponding to each of said different category spaces,

(d) marker means for indicating each questioned player's progress along said path;

(e) timer means for receiving a questioned player's answer; and



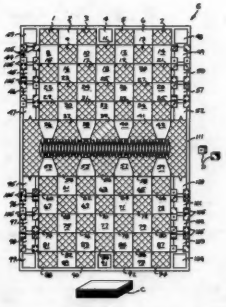
(f) structure defining an aperture through said board and means for removably and rotatably mounting said indicator means to said game board through said aperture.

4,984,806

BOARD GAME

Steven R. Alfred, Rte. 1, Box 1418, Checotah, Okla. 74426

Filed Feb. 26, 1990, Ser. No. 484,980
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—255 **1 Claim**



1. A game board having a top surface divided by indicia into squares, said squares being arranged in a grid matrix formed by a plurality of rows extending between two opposite sides of the game board and columns extending between two opposite ends of the game board defining an upper end and a lower end, the game board oriented such that a first and second player will respectively assume positions adjacent the opposite ends of the game board, and

the board divided medially between the upper end and the lower end by a single row of divider squares extending

between opposite sides of the game board defining an upper playing field and a lower playing field of the first and second player respectively, and

a column of squares adjacent the opposite sides of the game board defined by non-playing field squares, the rows and columns oriented between the first and second non-playing field squares defined by playing field squares to require a player movement and strategy about the non-field squares within the playing field squares, and

a deck of playing card means for division equally between the first and second players with the playing card means including playing cards for use as tokens for positioning and movement throughout the playing field and non-playing field squares, and

a plurality of chance controlled members for directing movement of the tokens, each chance controlled member defined by a dice including an indicia thereon, the indicia designated 1–6 corresponding to 6 faces of each dice, and

wherein each row of squares adjacent each end of the game board includes a prison square within the playing field squares for temporary storage of playing cards of an opposing player therein, and

wherein the playing card means is defined by fifty-two cards divided equally into four suits defined by a heart suit, a club suit, a spade suit, and a diamond suit, and

wherein each column of non-playing field squares includes a castle square positioned adjacent respective ends of the game board, and the squares within the column of non-playing field squares oriented forwardly of the castle squares are each defined by dice squares, the dice squares including dice digital designations positioned at corners of each dice square for indication of digital designations to be obtained by the chance members to enable access within the dice squares by opposing players.

4,984,807

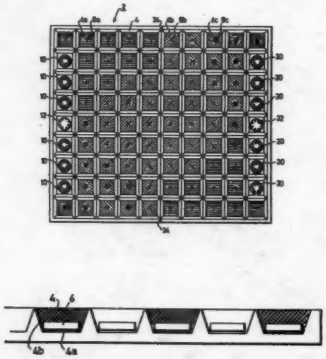
BOARD GAME

Baruch Shiryon, Anderson St. 2, Tel Aviv, Israel

Filed Jan. 12, 1990, Ser. No. 463,728

Int. Cl.[5] A63F *3/02, 3/00*

U.S. Cl. 273—262 **14 Claims**



1. A board game playable by at least two players, comprising:

a board divided into a plurality of identical polygonal areas each formed with a recess of the same configuration as, but of smaller dimensions than, said polygonal areas and centrally thereof;

a plurality of removable tiles, each of the shape of one of said recesses and of sufficient number to fill the recesses of all said areas of the board when placed thereon;

a plurality of playing pieces for each player movable over the tiles when placed on the board;

and an object piece for each player to be placed on the board and to be protected against capture by a playing piece of the other player when moved over the tiles on the board;

said plurality of removable tiles being marked to indicate at least two different kinds of terrain each permitting a different kind of movement of the playing pieces thereover when attempting to capture the object piece of the other player.

4,984,808

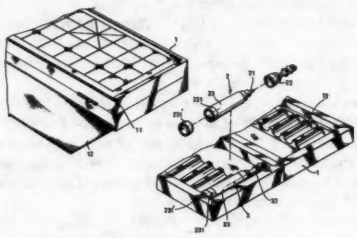
COLOR-CRAYONS AND BOARDGAMES COMBINATION SET

Jean Young, F 2, No. 52, Tiann Shoei Rd., Taipei, Taiwan

Filed May 10, 1990, Ser. No. 521,509

Int. Cl.[5] A63F *3/02;* **B65D** *85/02*

U.S. Cl. 273—283 **3 Claims**



1. A color-crayons and board games combination set, comprising a case comprised of two pivoted parts, said pivoted parts having each a track on its back side around its periphery with a plurality of boards set therein and defining therein a trough for receiving a variety of writing materials, said trough being covered with a sliding cover board, and a plurality of raised grooves for receiving different pieces, said pieces being each used as a color-crayon and a chessman for a board game.

4,984,809

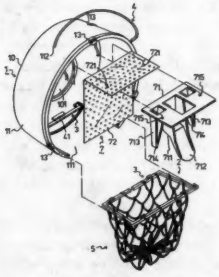
BALL GAME DEVICE

Hsi-Shih Chiang, 4F, No. 8-1, Lane 77, Sung-Chiang Rd., Taipei, Taiwan

Filed May 10, 1990, Ser. No. 521,993

Int. Cl.[5] A63B *63/02*

U.S. Cl. 273—401 **6 Claims**



1. A ball game device comprising:

a vertical panel having a through-hole, a front side and rear side;

a basket having a net and a horizontal mounting looped frame for holding said net, said looped frame having one side attached to said vertical panel and two opposite sides adjacent to two ends of said one side of said looped frame;

a guide member attached to said vertical panel at said rear side and projecting rearward from said vertical panel, said guide member extending upward to a location above said through-hole from one of opposite sides of said looped frame and then extending downward to the other of opposite sides of said looped frame; wherein the improvement is characterized by:

a guide plate substantially surrounded by said guide member, said guide plate partially facing the through-hole of said vertical panel and partially facing said looped frame of the basket; whereby, a ball thrown into said through-hole can be smoothly guided into said basket by said guide plate, avoidirng rebounding by the repulsive force.

4,984,810

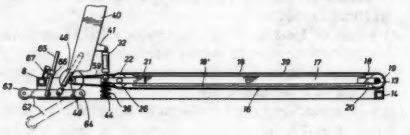
TREADMILL

Kenneth W. Stearns, and John K. McGee, both of Houston, Tex., assignors to Stearns & McGee, Houston, Tex.

Continuation of Ser. No. 125,112, Nov. 25, 1987, abandoned. This application Jul. 13, 1989, Ser. No. 379,693

Int. Cl.[5] A63B *22/02*

U.S. Cl. 272—62 **17 Claims**



1. An exercise treadmill comprising

a base having forward and rear ends, pivot means disposed near the rear end of said base,

a belt system including forward and rear rollers and an endless belt placed about said rollers, said belt having an upwardly exposed operative section and a downwardly exposed return section,

a belt support platform structure having forward and rear ends, said platform structure disposed between said upwardly exposed operative section and said downwardly exposed return section of said belt system, said platform structure including a decking member operably arranged such that said operative section of said belt slides over said decking member when said belt system is in operation, said decking member providing support to a runner's foot as it lands on said upwardly exposed operative section of said belt,

said platform structure including forward connection member means connected to said forward end of said decking member for carrying said forward roller of said belt system,

said platform structure including rear connection member means connected to said pivot means for pivotally carrying said platform structure with respect to said rear end of said base,

means for mounting said rear roller of said belt system to said base near the rear end of said platform structure, and

shock absorbing platform support means including in combination a spring means and a separate damping means operable between said forward member connection means and said base for supporting said platform structure and aid belt system and reducing impact forces of a runner while running on said operative section of said belt.

4,984,811

PRESSURE CONTROL SYSTEM FOR STERN TUBE SEALS

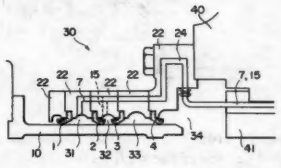
Tsuneo Kuwabara, Toyama, and Jingo Miyazaki, Uozu, both of Japan, assignors to Dover Japan, Inc., Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 330,011

Claims priority, application Japan, Mar. 31, 1988, 63-43838[U]

Int. Cl.[5] F16K *41/00*; B63H *23/36*

U.S. Cl. 277—3 **6 Claims**



1. A pressure control system for stern tube seals including at least two resilient radial lip-type seal rings brought into sliding contact with a propeller shaft liner and a housing member which is secured to a stern frame member of a hull in such a manner as to surround a propeller shaft and adapted to hold said seal rings, the lip of one of said seal rings being disposed most closely to the propeller side and being arranged to face outboard, the lip of a seal ring adjacent to said one seal ring being arranged to face inboard so as to form an aft annular chamber, and the lips of other adjacent seal rings being sequentially arranged in such a manner as to face suitable directions to form adjacent annular chambers, said pressure control system comprising:

an air-supplying mechanism disposed in said aft annular chamber and for filling said aft annular chamber with compressed air which is higher by a differential pressure in response to the seawater pressure and to bleed air between said shaft liner and said seal ring being disposed most closely to the propeller side into the seawater, thereby preventing the ingress of the seawater; and

pressurized oil-circulating mechanism disposed in an adjacent annular chamber adjacent to the aft annular chamber and for filling said adjacent annular chamber with a fluid which is maintained at a fixed positive differential pressure in response to the air pressure within said aft annular chamber, thereby preventing the leakage of lubricating oil contained in said stern tube to the outboard of the ship.

4,984,812

OIL SEAL ASSEMBLY

Yoshiaki Wada, Niigata; Tunesaku Itaba; Koichiro Kasahara, both of Kashiwazaki; Tomokimi Mizuno, Chiryu, and Yutaka Momose, Anjyo, all of Japan, assignors to Kabushiki Kaisha Riken, Tokyo and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Continuation of Ser. No. 167,099, Mar. 11, 1980, abandoned. This application Oct. 30, 1989, Ser. No. 428,435

Claims priority, application Japan, Mar. 31, 1987, 62-76334

Int. Cl.[5] F16J *15/00*

U.S. Cl. 277—153 **4 Claims**

1. An oil seal assembly comprising:

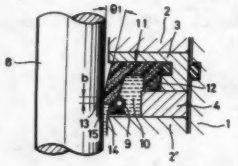
an oil seal having a lip for contacting an outer peripheral surface of a reciprocating shaft;

a holder for holding said oil seal about the shaft; and

an annular spring for urging the lip against said outer peripheral surface of the shaft;

said lip including first and second flat surfaces inclined with respect to said outer peripheral surface of the shaft, said first flat surface having a first angle of inclination greater than a second angle of inclination of said second flat surface in the absence of contact between said second flat

surface and said peripheral surface, said second angle of inclination having a value substantially within a range of 1°30' to 3° C. such that when said oil seal is mounted on the shaft, said second flat surface provides a sealing surface having a substantially constant width, said second flat



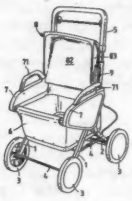
surface being brought into surface contact with said outer peripheral surface of the shaft by an urging force applied by said annular spring, said second flat surface being formed along an entire circumferential inner surface of said lip.

4,984,813

SHOPPING PUSHCART

Takehiko Takahashi; Hideo Saito; Takashi Watanabe, and Tomihioro Kaneko, all of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1989, Ser. No. 378,948
Claims priority, application Japan, Jul. 13, 1988, 63-92804[U]
Int. Cl.[5] B62B *7/12*
U.S. Cl. 280—30 **4 Claims**



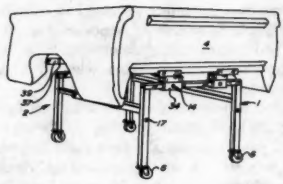
2. A shopping pushcart comprising a frame constituting a body of said pushcart; an article-holding container mounted inwardly of said frame and having an open top; and a lid plate movably mounted through an angularly movable link means above the open top of said article-holding container such that said lid plate is movable to a generally upstanding position and is also reversible, opposite faces of said lid plate having shapes to serve as a lid surface for said container and a seat surface, respectively; further comprising a seat frame mounted on an upper portion of said article-holding container, said lid plate being mounted via said link means on said seat frame and disposed inwardly thereof, and wherein said seat frame has a generally U-shape in a horizontal plane and comprises a pair of opposed side walls and back wall interconnecting said side walls at the back of said pushcart, said opposed side walls serving as armrests when said lid plate has the seat surface positioned upward.

4,984,814

ADJUSTABLE PICKUP TRUCK BOX CARRIER

Bruce Graffunder, 1305 Independence St., N., Champlin, Minn. 55316

Filed Aug. 21, 1989, Ser. No. 396,314
Int. Cl.[5] B62B *3/02, 3/10*
U.S. Cl. 280—35 **7 Claims**



1. An adjustable pickup truck box carrier for body shops where truck boxes are characterized as having body panels, frame members with apertures therethrough, vary in size and must be moved to various work stations and positions for interference free sanding, bodywork and painting, the carrier comprises:

(a) a pair of inverted U-shaped, parallel spaced vertical supports each having a pair of vertically extensible legs with a cross member therebetween;

(b) a pair of spaced, parallel, telescopically extensible longitudinal side members extending from and between said vertical supports;

(c) a pair of load securing assemblies slidably mounted to each cross member to permit transverse movement of the securing assemblies without movement of the supports and the side members; and

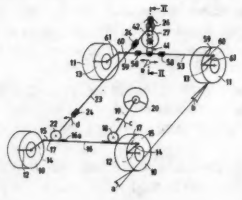
(d) a box bracket on each assembly adaptable to securely receive and hold one frame member of the truck box to the carrier for moving and positioning the truck box on the carrier.

4,984,815

STEERING DEVICE FOR A MOTOR VEHICLE WITH FOUR STEERED WHEELS

Marco Visconti, Bollate, Italy, assignor to Alfa Lancia S.p.A., Arese, Italy

Filed Jul. 31, 1989, Ser. No. 387,157
Claims priority, application Italy, Aug. 4, 1988, 21651 A/88
Int. Cl.[5] B62D *7/00*
U.S. Cl. 280—91 **7 Claims**



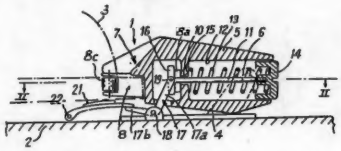
1. A steering device for a motor vehicle having a body with steered front and rear wheels, said steering device comprising at least one drive shaft **(25)** rotatably supported in the motor vehicle body and operationally connected to the steering mechanism **(16, 18)** for the front wheels **(10)** by first motion transmission means **(16*a*, 22)** and to steering levers **(61)** for the vehicle rear wheels **(11)**, said drive shaft **(25)** being connected by second motion transmission means **(26, 27)** to a driven shaft

(28), each of the two shafts (25, 28) having an axis and being provided with a respective eccentric pin (31, 32), each pin (31, 32) being slidably and rotatably engaged with a link element (41) which is operationally connected to said steering levers (61) for the rear wheels (11), and said link element (41) having a substantially rectangular slot (42) with a length along which each pin (31, 32) slides.

4,984,816
SAFETY BINDING

Pierre Rullier, Annecy, France, assignor to Salomon S.A., Annecy Cedex, France

Filed Dec. 8, 1988, Ser. No. 281,208
Claims priority, application France, Dec. 9, 1987, 87-17152
Int. Cl.[5] A67C 9/08
U.S. Cl. 280—625 23 Claims



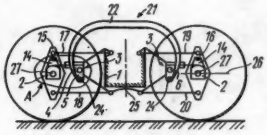
1. Safety binding for releasably maintaining a front portion of a boot mounted on a ski, comprising a body mounted on a base affixed to said ski, said body comprising a retention jaw in a rear portion thereof, said retention jaw comprising a solegrip and two opposed lateral retention wings and having an engagement position, and an energization mechanism positioned in said body to elastically return said jaw to said engagement position upon movement away from said engagement position, said energization mechanism comprising an energy spring supported, at one end, on a support surface connected to said body and, at another end, on a force transmission element which is movable for longitudinal displacement in said body and coupled to said jaw in a manner so as to elastically bias said jaw against said front portion of said boot, to ensure the retention of said boot on said ski, wherein said body is pivotably mounted on said base in a front portion of said base around a first substantially horizontal and transverse axis, and wherein said force transmission element which is coupled to said jaw is connected to an upper end of a rigid linkage element which is journalled at its lower end on said ski around a second substantially horizontal and transverse axis and which is arranged in a manner such that a rocking movement of said body upwardly, around said first substantially horizontal and transverse axis translates into a displacement of said force transmission element in a direction corresponding to an additional bias of said energy spring, and a displacement of said force transmission element in said body translates into a rocking movement of said body.

4,984,817
FULLY ARTICULATED SUSPENSION OF TANDEM WHEELS OF A TRANSPORT VEHICLE

Ramil A. Azamatov, Naberezhnye Chelny; Mikhail N. Zamitter, Kiev; Evgeny M. Zema, Sinelnikovo; Vladimir A. Nedorezov, Sinelnikovo; Anatoly K. Oblovatsky, Sinelnikovo, and Igor G. Smirnov, Naberezhnye Chelny, all of U.S.S.R., assignors to Kievsky Injenerno-Stroitelny Institut, Kiev, U.S.S.R.

PCT No. PCT/SU87/00081, § 371 Date Mar. 22, 1989, § 102(e) Date Mar. 22, 1989, PCT Pub. No. WO89/00926, PCT Pub. Date Feb. 9, 1989
PCT Filed Jul. 23, 1987, Ser. No. 335,783
Int. Cl.[5] B60G 5/04
U.S. Cl. 280—680 7 Claims

1. A fully articulated suspension of tandem wheels of a transport vehicle having a frame with axles, said suspension comprising at least one pair of double-arm levers each of which mechanically linked with the frame and the corresponding axle of the transport vehicle, means for absorption of dynamic loads each of said means being articulated to one of the arms of the corresponding double-arm lever, and torque reaction rods, one end of each rod being connected with the frame while its other end is connected with the corresponding axle of the transport vehicle, characterized in that said suspension additionally contains as many means (8) for the transmission of static and dynamic loads as there are double-arm levers (3), said loads arising due to interaction of each axle (2) of the

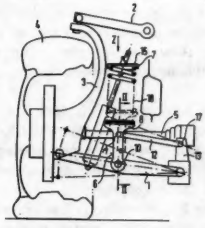


transport vehicle with the corresponding means (21) for absorption of dynamic loads via the other arm (4) of the double-arm lever (3), each of them being mechanically linked with the corresponding axle (2) of the transport vehicle and with the other one of said arms (4) of the double arm lever (3), each means (21) for absorption of dynamic loads comprising two stirrup-shaped plate springs (22, 23 or 28, 29) which ensure a constant contact between each means (8) for transmission of static and dynamic loads with the corresponding axle (2), each of said springs being articulated with the first of said arms (5) of the corresponding double-arm lever (3).

4,984,818
WHEEL SUSPENSION

August Achleitner, Weil der Stadt, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Oct. 13, 1989, Ser. No. 421,325
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1988, 3836561
Int. Cl.[5] B60G 3/14, 11/14
U.S. Cl. 280—701 5 Claims



1. A motor vehicle wheel suspension double wishbone axis, comprising at least one wheel guiding link which is arranged below a wheel drive shaft and is operatively connected with a shock absorber and a coil spring held separately from the shock absorber, wherein the coil spring is pivotally held at the at least one wheel guiding link by an interposed guiding element and is guided by an auxiliary control arm, and the interposed guiding element comprises a spring plate which is disposed above the wheel drive shaft, a projected surface of the spring plate intersecting with the wheel drive shaft which extends adjacent to the spring plate.

4,984,819

AUTOMOTIVE SUSPENSION SYSTEM AND SHOCK ABSORBER THEREFOR

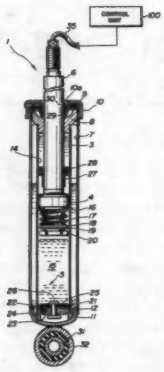
Shinobu Kakizaki; Fumiyuki Yamaoka; Shigeru Kikushima, and Junichi Emura, all of Kanagawa, Japan, assignors to Atsugi Motor Parts Company, Limited, Kanagawa, Japan

Filed Apr. 13, 1989, Ser. No. 337,349

Claims priority, application Japan, Apr. 14, 1988, 63-92800; Apr. 15, 1988, 63-93099; Apr. 15, 1988, 63-50768[U]; Apr. 15, 1988, 63-50770[U]; Apr. 19, 1988, 63-53299[U]; Apr. 19, 1988, 63-53300[U]; Aug. 31, 1988, 63-115452[U]; Nov. 18, 1988, 63-150592[U]

Int. Cl.[5] B60G *17/00, 17/08*

U.S. Cl. 280—707 30 Claims



1. An automotive suspension system comprising:

a shock absorber disposed between a vehicle body and a suspension member rotatably supporting a road wheel, said shock absorber including a cylinder tube connected to one of said vehicle body and said suspension member and defining an internal space, a piston disposed within said internal space for dividing said internal space into first and second chambers and connected to the other of said vehicle body and said suspension member for relative movement with respect to said cylinder tube, said first and second chambers being filled with a working fluid;

a fluid communication means for establishing fluid communication between said first and second chambers with a limited fluid flow rate for generating a damping force against relative motion between said piston and said cylinder tube;

a valve means associated with said fluid communication means for controlling flow restriction of said fluid communication means, said valve means being variable of flow restriction characteristics for varying damping characteristics of said shock absorber;

a sensor means for monitoring fluid pressure in said first chamber for producing a piston stroke indicative signal indicative of magnitude of piston stroke;

an actuating means, associated with said valve means and responsive to a control signal, for controlling said valve means for adjusting flow restriction characteristics according said said control signal; and

a controlling means, receiving said piston stroke indicative signal, for deriving a piston stroke speed representative data on the basis of said piston stroke speed reaching a peak value for producing said control signal for harder damping characteristics and detecting alternation of piston stroke direction for producing said control signal for softer damping characteristics.

4,984,820

DAMPING FORCE CONTROL SYSTEM FOR SHOCK ABSORBER VARIABLE WITH FREQUENCY OF VEHICLE HEIGHT DIFFERENCE EXCEEDING LIMIT VALUE

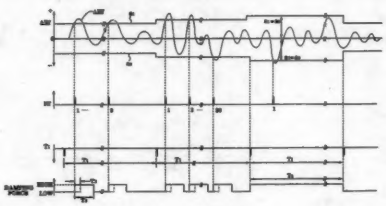
Hiromitsu Uchiyama; Masayuki Kawamoto, both of Toyota, and Yoriko Inada, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 18, 1989, Ser. No. 381,328

Claims priority, application Japan, Jul. 22, 1988, 63-183087; Oct. 28, 1988, 63-272740; Dec. 15, 1988, 63-317118

Int. Cl.[5] B60G *17/08*

U.S. Cl. 280—707 10 Claims



1. A damping force control system for a shock absorber mounted between a vehicle wheel and a vehicle body of a vehicle such as an automobile and adapted to selectively provide a high damping force operation or a low damping force operation, comprising a vehicle height difference detecting means for detecting a vehicle height difference of the vehicle body relative to the vehicle wheel, and a shock absorber control means for controlling said shock absorber to provide said high damping force operation or said low damping force operation, said shock absorber control means controlling said shock absorber to provide said high damping force operation when said vehicle height difference exceeds a certain limit value, wherein said shock absorber control means counts a frequency of said vehicle height difference exceeding said certain limit value for each certain cycle period, and said shock absorber control means controls said shock absorber to provide said high damping force operation for a certain time duration in each said cycle period, the ratio of said certain time duration to said cycle period being varied in accordance with said frequency so that said ratio is increased along with an increase of said frequency.

4,984,821

GAS EXPANSION TYPE SHOCK ABSORBING SAFETY CLOTH FOR AUTOCYCLE DRIVER

Sang N. Kim, Seoul, Rep. of Korea; Alfred Kroiss, and Heinz Methfessel, both of Wartenberg, Fed. Rep. of Germany, assignors to Gasomatic - Airbag International Ltd., Seoul, Rep. of Korea

Filed May 9, 1989, Ser. No. 349,583

Claims priority, application Rep. of Korea, May 9, 1988, 88-5371

Int. Cl.[5] B60R *21/16*

U.S. Cl. 280—728 15 Claims

1. A gas expansion type shock absorbing safety cloth for autocycle drivers, comprising:

shock absorbing means capable of instantly expanding through the filling of stored compression gas upon departing of the wearer of the safety cloth from the autocycle by over a predetermined distance;

a gas regulator connected through gas conduits to said shock absorbing means;

one or more compressed gas storage and discharge devices connected to said gas regulator in such a manner that they can momentarily discharge the stored compressed gas to

said gas regulator in response to the signal emitted by an ignition controller;

a trigger device affixed to said autocycle connected through an electric wire and a pull string to said ignition controller in such a manner that, upon detection of a certain predetermined separation distance of the wearer of the safety cloth from the autocycle, a warning sound is generated or the compressed gas is discharged;

a connector separable into two halves disposed at an intermediate position of both the electric wire and the pull string in such a manner that it is separated upon applying

of a pulling force exceeding a certain predetermined value;

and said shock absorbing means, gas regulator, compressed gas storage and discharge devices and ignition controller being integrated as a unit in said safety cloth;

whereby upon the application of a pulling force exceeding a certain predetermined value, said connector separates into two halves and said safety cloth with the above said articles integrated as a unit therein is disconnected altogether from the autocycle, said safety cloth being reusable by re-uniting said connector and restoring said compressed gas storage and discharge devices.

4,984,822

ADJUSTABLE VEHICLE SEAT FOR USE WITH A PASSIVE SEAT BELT

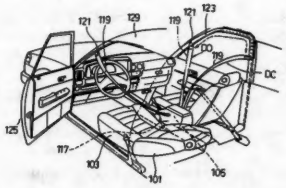
Kenzo Shimizu, Yokusuka, and Shizuo Ogata, Zama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jul. 3, 1989, Ser. No. 374,825

Claims priority, application Japan, Jul. 12, 1988, 63-91392[U]

Int. Cl.[5] B60N *1/10*; B60R *21/08*

U.S. Cl. 280—804 **6 Claims**



1. In a vehicle having an adjustable seat and a passive seat belt for an occupant of said seat, said passive seat belt including a guide rail arranged along an upper edge of an opening which is opened and closed by a vehicle door outboard of said seat, a slider installed in said guide rail and movable along said guide rail, a retractor disposed inboard of said seat, and webbing having a first end attached to said slider and a second end rolled up by said retractor, said seat comprising a seat cushion having a first joining portion;

a seat back having a second joining portion at which it is pivotally supported on said first joining portion of said seat cushion; and

means for defining a clearance between said cushion and seat back for preventing said webbing from being held between said cushion and seat back when said seat back is in a forwardly pivoted position.

4,984,823

LABEL HAVING SUBLIMATION TRANSFERRED IMAGE

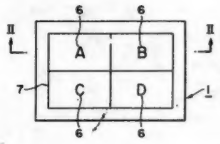
Tohru Ishii; Koichi Asahi, and Masahisa Yamaguchi, all of Shinjuku, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Feb. 13, 1989, Ser. No. 309,300

Claims priority, application Japan, Feb. 18, 1988, 63-36184

Int. Cl.[5] B42D *15/00*

U.S. Cl. 283—81 **4 Claims**



1. An image receiving sheet, comprising:

a peeling sheet;

a label portion adhered to said peeling sheet, said label portion comprising a tacky layer laminated on said peeling sheet, a sheet substrate laminated on said tacky layer, and an image-receiving layer laminated on said sheet substrate, said label portion having at least one frame of a sublimation transferred image formed in said receiving layer by transferring a sublimable dye from a colorant layer of a heat transfer sheet to said image-receiving layer by heating according to an image formation; and

cutting lines are formed through said label portion to section said at least one frame of a sublimation transferred image, so as to allow individual peeling of said sectioned frames of the label portion from said peeling sheet.

4,984,824

DOCUMENT WITH AN OPTICAL DIFFRACTION SAFETY ELEMENT

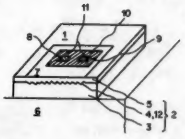
Gregor Antes, Zurich, and Christian Saxer, Urdorf, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Feb. 15, 1989, Ser. No. 311,596

Claims priority, application Switzerland, Mar. 3, 1988, 805/88

Int. Cl.[5] B42D *15/00*

U.S. Cl. 283—91 **11 Claims**



1. A document comprising

an embossed microscopic structure which operates through optical diffraction to serve as a security element for preventing unauthorized copying, said embossed structure including numerous surface portions,

each of said surface portions having a predetermined relief structure with a spatial frequency larger than 10 lines/mm, each relief structure of each surface portion being different from that of adjoining surface portions, and

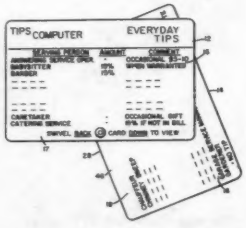
a group of said surface portions having a predetermined geometric shape which carries security information and a largest dimension of less than 0.3 mm.

4,984,825

INFORMATION BEARING ASSEMBLY

Eugene C. Fowler, Denver, Colo., assignor to Tip Computers International, San Diego, Calif.

Filed May 2, 1989, Ser. No. 347,245
Int. Cl.[5] B42D 15/00
U.S. Cl. 283—98 6 Claims



1. An information bearing assembly, comprising:

first and second flat information bearing cards of substantially identical shape and dimensions, each having parallel upper and lower edges and opposite side edges and informational indicia arranged in an alphabetical sequence on both front and rear faces arranged in successive, spaced rows extending parallel to said upper and lower edges;

pivot means for pivotally connecting said cards together at a central position on the lower edge of the first card and a central position on the upper edge of the second card;

said pivot means comprising means for allowing aid cards to swivel relative to one another between a storage position in which they are positioned one on top of the other in face to face engagement and an open position in which the second card is swiveled downwardly relative to the first card until the opposite side edges of the card are aligned and the informational indicia on the cards forms a continuous vertical sequence on both faces of the cards of spaced successive rows of information reading parallel to the upper and lower edges of the cards, the information sequence continuing successively from the front face of the open cards to the rear face of the open cards.

4,984,826

HOSE CONNECTION ASSEMBLY

Takahiro Yokomatsu; Kenji Mine, and Shinichiro Kato, all of Tokyo, Japan, assignors to Bridgestone Flowtech Corporation, Tokyo, Japan

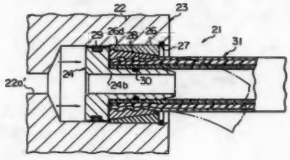
Filed Sep. 26, 1988, Ser. No. 249,295
Claims priority, application Japan, Mar. 8, 1988, 63-55390
Int. Cl.[5] F16L 17/00
U.S. Cl. 285—101 5 Claims

1. A hose fitting for connecting a hydraulic hose to a hydraulic system including a wall member which has an axially inner reduced diameter bore portion formed with a reduced diameter bore and an axially outer enlarged diameter bore portion formed with an inner circumferential groove and an enlarged diameter bore connected to the reduced diameter bore, comprising:

a cylindrical member axially slidable within said enlarged diameter bore portion of said hydraulic system and having a radial flange portion and an axial tubular portion extending axially outwardly from said radial flange portion, the axial tubular portion being formed with a through bore communicating with said axial reduced bore of said reduced diameter bore portion of said hydraulic system, the cylindrical member being moved axially outwardly by an internal pressure of said hydraulic system;

a sleeve axially fixedly mounted on said enlarged diameter bore portion of said hydraulic system and having an inner inclined surface;

a collet arranged between said cylindrical member and said sleeve and axially movable within said enlarged diameter bore portion of said hydraulic system, the collet having an outer surface engageable with said inner inclined surface of said sleeve and being radially inwardly constrictible



when moving axially outwardly within said sleeve, the hydraulic hose being merely inserted and crimped between said collet and said axial tubular portion of said cylindrical member by axial outward movement of said collet caused by axial outward movement of said cylindrical member;

said sleeve having a maximum inner diameter portion whose diameter is slightly smaller than the outer diameter of said flange portion of said cylindrical member, and the collet being retained at said maximum inner diameter portion at a predetermined internal pressure not so as to excessively crimp said hydraulic hose; and

a stop member received in said circumferential groove of said enlarged diameter bore portion and adapted to limit axial outward movement of said sleeve and collet.

4,984,827

CONCENTRIC PIPING FLEX JOINT

George W. Peppel, Arlington, and Paul E. Sullivan, Bedford, both of Tex., assignors to Lockheed Corporation, Burbank, Calif.

Division of Ser. No. 9,255, Jan. 30, 1987, Pat. No. 4,789,410.
This application Aug. 26, 1988, Ser. No. 237,502
Int. Cl.[5] F16L 47/00
U.S. Cl. 285—133.1 5 Claims

1. A flex joint for connecting a first member to a second member comprising:

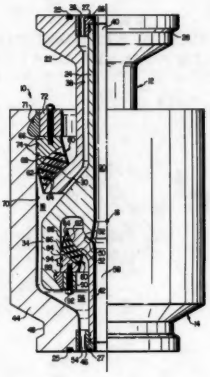
a first rigid pipe connector for rigid connection to the first member;

a second rigid pipe connector for rigid connection to the second member;

means having elastomeric elements deformable in shear to permit relative movement between the first and second rigid pipe connectors about a pivot point;

each of said first and second rigid pipe connectors incorporating concentric inner and outer members, a first passage being formed in the annular space between said inner and outer members and a second passage being formed through the inner member, wherein the inner and outer members of said first rigid pipe connector each define an outer spherical surface, the inner and outer members of said second rigid pipe connector each defining an inner

spherical surface facing one of said outer spherical surfaces, said elastomeric elements being bonded between



facing spherical surfaces, each of said spherical surfaces being centered on the pivot point.

4,984,828

DEVICE FOR SEALING THE END OF A FLEXIBLE COLLAR TO A FLEXIBLE TUBULAR WALL

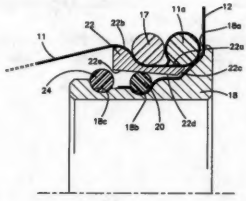
Jean-Jacques Lepissier, Vendome, France, assignor to S.N.E.I.A Calhene, Velizy, France

Filed Dec. 18, 1989, Ser. No. 452,678

Claims priority, application France, Dec. 19, 1988, 88 16735

Int. Cl.[5] F16L *39/04*

U.S. Cl. 285—200 **5 Claims**



1. A sealing device on the end of a flexible collar on a flexible tubular wall which includes:

a rigid inner ring that has a first and second adjacent grooves on an outer surface and a shoulder adjacent the first of said grooves, with flexible tubular wall mounted on said first groove and against the shoulder;

a toric seal that can roll from one groove to another to lock the flexible tubular wall in said first groove; and

a rigid outer ring tightly supporting an end of said collar with an inner surface varying in diameter which ensures that during nesting of the outer ring onto the inner ring the toric seal between the second and first grooves rolls and the outer ring abuts against said shoulder.

4,984,829

SCREW COUPLING JOINT

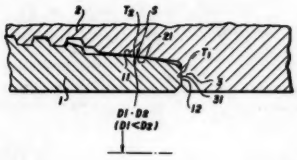
Takeshi Saigo, Kawasaki; Tomohiko Tokuya; Haruo Kamimura, both of Yokohama; Mitsuaki Hori, Kamakura, and Hidenori Yasuoka, Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 171,212, Mar. 17, 1988, abandoned, which is a continuation of Ser. No. 937,459, Dec. 2, 1986, abandoned, which is a continuation of Ser. No. 790,636, Oct. 23, 1985, abandoned, which is a continuation of Ser. No. 409,975, Aug. 20, 1982, abandoned. This application Apr. 21, 1988, Ser. No. 184,454

Claims priority, application Japan, Apr. 16, 1982, 54409[U]

Int. Cl.[5] F16L *25/00*

U.S. Cl. 285—334 **4 Claims**



1. A screw coupling joint having a longitudinal axis and comprising a male screw portion and a female screw portion, the male screw portion having a threaded portion, an end portion with a tapered convex circumferential surface and a contact end having a contact surface with the entire contact surface perpendicular to the longitudinal axis of the coupling unit, the female screw portion having a threaded portion, an end portion with a taper of 1° to 3° and a stopper having a contact surface perpendicular to said longitudinal axis of said coupling joint, said tapered convex end portion of said male screw portion having a contact diameter D_2 and said tapered end portion of said female screw portion having a contact diameter D_1 where $D_2 > D_1$ and wherein, when said male screw portion is inserted and threaded into said female screw portion by said threads on said male and female portions to make-up said coupling joint, said contact diameter D_2 and D_1 engage, said end portions at said contact diameters are compressed to form a first metal seal at said contact diameters and, after said first metal seal is formed, said entire perpendicular contact surface of said male screw portion contacts and engages said perpendicular contact surface of said stopper, forms a second metal seal at said perpendicular surfaces and a stop preventing further compression at said first metal seal.

4,984,830

COLLET TYPE CONNECTOR

Brian Saunders, Chipping Sodbury, England, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 29, 1989, Ser. No. 458,957

Claims priority, application United Kingdom, Nov. 2, 1988, 8825623; European Pat. Off., Oct. 6, 1989, 89310252

Int. Cl.[5] F16L *19/065*

U.S. Cl. 285—368 **7 Claims**

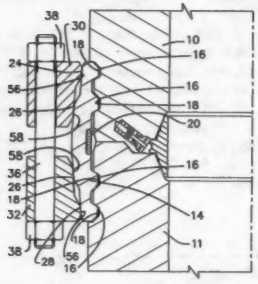
1. A tubular connector, comprising:

a first tubular member and a second member, each having ends shaped to receive a plurality of segmented latching means thereon,

a pair of axially spaced cam rings which can engage said segmented latching means,

means for drawing the cam rings axially together to force

the latching means into latching engagement with the ends of said tubular members, and



a snap ring contacting the inner annular surface of the latching means to bias said latching means towards its unlatched position.

4,984,831

PIPE SOCKET AND A METHOD OF FORMING A PIPE SOCKET

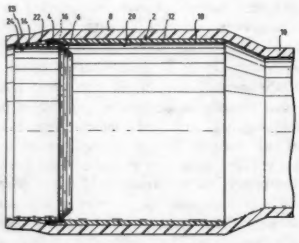
Christer Bengtsson, Värnamo, Sweden, assignor to Forsheda AB, Forsheda, Sweden

Filed Oct. 18, 1988, Ser. No. 259,126

Claims priority, application Sweden, Oct. 29, 1987, 8704231

Int. Cl.[5] F16L *17/00*

U.S. Cl. 285—379 **17 Claims**



13. A pipe socket comprising: a sleeve having an outer surface and an inner surface, an end portion of a pipe consisting of thermoplastic material molded around the sleeve, said pipe end portion having an inner surface, an outer sealing ring positioned between the inner surface of the pipe end portion and the outer surface of the sleeve, said outer sealing ring sealing the pipe end portion and the sleeve in relation to each other, and an inner sealing ring positioned at the inner surface of the sleeve adapted for sealing the space between the inner surface of the sleeve and the outer surface of a spigot end of a connecting pipe introduced into the socket; said pipe socket characterized in that: the outer sealing ring and the inner sealing ring are connected with each other, the sealing rings are chemically bound to said sleeve, the outer surface of the sleeve has a section of larger diameter and a section positioned adjacent a free end of the pipe socket having smaller diameter, there being an annular surface of said sleeve extending between said sections of said sleeve in a direction transversely of the axis of the sleeve, and characterized further in that the outer sealing ring is constituted by a sealing lip having a base portion which is connected with the sleeve at said annular surface of said sleeve and is positioned in a space defined by said annular surface and by the inner surface of the pipe end portion and an outer surface of the section of the outer surface of the sleeve having smaller outer diameter.

4,984,832

LOCK MECHANISM WITH STEP IN LINKAGE

Victor R. Canepa, Las Fabricas 138, Lima 1, Peru

Filed Jan. 12, 1990, Ser. No. 464,478

Int. Cl.[5] E05C *9/16*

U.S. Cl. 292—36 **2 Claims**

1. In a locking mechanism with four latching bolts having a bottom case and a cover including radially extending guiding slots, said locking mechanism further including teethed disk means rotably mounted to said case and including a geared cylinder in cooperative meshed engagement with said teethed disk means to cause the rotation of the latter and including linkage means, having two ends, with one of said ends being pivotally mounted to said disk means, and further including rod members, with two rod ends, having one rod end pivotally connected the other end of said linkage means through outer pin means that protrude through said guiding slots and the other rod end being rigidly mounted to one of said latching bolts, the improvement comprising a step in said linkage means so that when in the innermost position the ends of said linkage means pivotally mounted to said rod members converge to axially overlay the ends of adjacent linkage means that are pivotally mounted to said disk means thereby maximizing the travel of said latching bolts.

4,984,833

LOCK HOOK

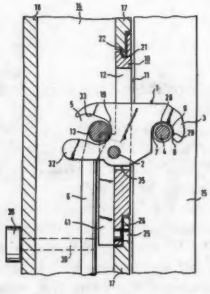
Hans Knürr, Kirchheim, Fed. Rep. of Germany, assignor to Knürr-Mechanik für die Elektronik Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1989, Ser. No. 413,610

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833283

Int. Cl.[5] E05C *19/12*

U.S. Cl. 292—96 **19 Claims**



1. In combination with a door and a cabinet,

a lock plate having a face aligned with an inner face of said door and including an opening in an upper part thereof,

a pivot pin fixed within said opening,

a locking pin provided on said cabinet,

an actuating device, and

a lock hook comprising a lower lever arm and an upper closed path guide surrounding an engagement area for engagement with said actuating device, said engagement area being elongated and curved in shape and receiving the actuating device, said lock hook being pivotable, in said opening, about said pivot pin between a closed position and an open position, said lock hook having a hook area for engagement with said locking pin, the hook area projecting beyond the face of the lock plate when said lock plate is in said closed position, the hook area being pivotable into the lock plate so that the hook area does not project beyond said face of said lock plate when said lock hook is in said open position, said lock plate and said lock hook being preassembled as a subassembly which is inserted in the door of said cabinet.

4,984,834

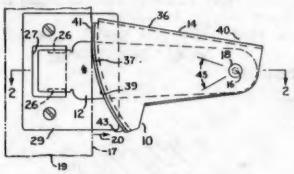
PORTABLE SECURITY LOCK

James G. Nickels, 5808 Calhoun, Dearborn, Mich. 48126

Filed Apr. 10, 1990, Ser. No. 507,042

Int. Cl.[5] E05C *19/18*

U.S. Cl. 292—297 **8 Claims**



1. A portable door lock comprising an elongated flat plate having one end portion thereof adapted to be inserted edgewise into a clearance space between the edge of a door and the facing surface of a door jamb; said one end portion of the flat plate having an ear means extending right angularly therefrom for entry into an opening in a strike plate carried on said facing surface of the door jamb; said elongated flat plate having its other end portion spaced away from the door when said plate is inserted into the clearance space; a door keeper element swingably connected to said flat plate near said other end portion of the plate; said door keeper element comprising at least one flat wall facially engaged with said flat plate for swinging slidable movement therealong, and a cam wall extending right angularly from said one wall; said cam wall having an arcuate cam surface adapted to engage a major face of the door when said ear means is engaged in the strike plate opening and the door is in a closed position; said arcuate cam surface being centered around a point offset slightly from the swing axis of the door keeper element, whereby swinging movement of the keeper element causes the arcuate cam surface to move angularly along the door face to a wedged condition; said arcuate cam surface having end areas thereof spaced different distances from the door keeper element swing axis, the distance differential being approximately three eighths of an inch.

4,984,835

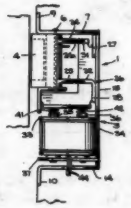
STRIKE WITH RECTILINEARLY MOVABLE KEEPER LOCKING MEMBER

Joseph Vadacchino, Elmont, N.Y., and William L. Herron, Elizabeth, N.J., assignors to Trine Products Corp., Bronx, N.Y.

Continuation of Ser. No. 289,216, Dec. 23, 1988, abandoned. This application Jun. 8, 1990, Ser. No. 555,358

Int. Cl.[5] E05C *19/16*

U.S. Cl. 292—341.16 **15 Claims**



1. A strike comprising:

a housing with a plurality of walls;

a keeper mounted on said housing for movement from a first position to a second position for respectively engaging a latch and moving away from the latch, said keeper having at least one lug extending therefrom toward a wall of said housing and movable along a predetermined path in a plane with movement of said keeper;

a locking member slidable mounted on said housing intermediate said keeper and said wall of said housing and movable rectilinearly in the direction transverse to said plane and said predetermined path of movement of said lug, said locking member having at least one arm thereon extending toward said lug, transversely of and away from aid wall and transversely to the direction of sliding movement of said locking member, said arm being engageable with said lug in one position of said locking member relative to said keeper for preventing movement of said keeper and said arm being out of the path of movement of said lug when said locking member is in another position relative to said keeper;

biassing means acting between said locking member and said housing and urging said locking member into one of the relative positions thereof; and

locking member actuating means for moving said locking member from the last-mentioned said one relative said position thereof into the other relative position thereof.

4,984,836

REMOTE AREA GOLF BALL RETRIEVER

Warren E. Redding, 14918 Scarlet Oak La., Tomball, Tex. 77375

Filed Apr. 4, 1989, Ser. No. 333,293

Int. Cl.[5] A63B *47/02*

U.S. Cl. 294—66.1 **3 Claims**

1. Golf ball retrieving apparatus for retrieving golf balls from a water hazard, comprising

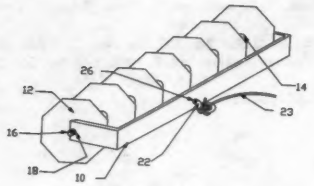
a one-half rectangular strap frame having parallel ends,

an axle connected to each of said ends,

a plurality of resilient, ball-pinching discs rigidly secured to said axle, each of said discs having a periphery with multiple straight sides to provide said discs with traction, said discs being spaced along said axle from each other at successive distances slightly less than the diameter of a golf ball, and

means attached to said frame for pulling said apparatus by said frame at an angle slightly above horizontal to provide

downward pressure on said frame by hydroplaning action and rolling said discs on the bottom of the water hazard



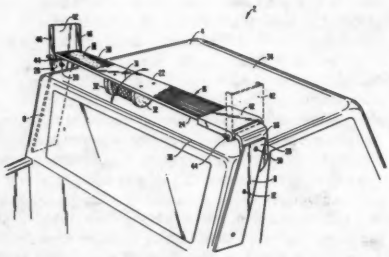
such that a golf ball being retrieved passes under said frame and is pinched between adjacent ones of said discs.

4,984,837

LOAD SUPPORT ASSEMBLY FOR PICKUP TRUCK

Houston J. Dise, 1111 W. El Camino, Ste. 109-299, Sunnyvale, Calif. 94087

Filed Apr. 3, 1990, Ser. No. 504,157
Int. Cl.[5] B60D *3/00*
U.S. Cl. 296—3 **16 Claims**



1. A load support assembly for use with a pickup truck or the like having a cab, the cab having a top, sides and a back, the back and top meeting at a rear edge, the load support assembly comprising:

an elongate load support having ends, a generally flat top surface and a bottom;

side supports, mounted to the sides of the cab;

means for pivotally mounting the ends of the load support to the side supports for pivotal movement of the load support about a generally horizontal axis; and

a support stop captured between the top of the cab and the bottom of the load support to stop rearward pivotal movement of the load support at a first angular orientation while providing vertical support for a load resting on the top surface.

4,984,838

DETACHABLE AUTOMOBILE FLOOR MAT HAVING A DETACHABLE FOOTREST

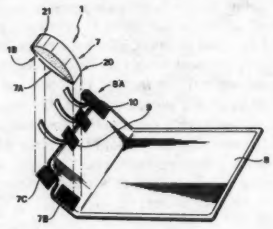
Hyun G. Kim, 115-295, Mun Won-Dong, Gwa Chun, Kyungki-Do, Rep. of Korea

Filed Feb. 13, 1990, Ser. No. 479,371
Claims priority, application Rep. of Korea, Feb. 17, 1989, 1636/89
Int. Cl.[5] B60N *3/06*
U.S. Cl. 296—75 **11 Claims**

1. An automobile floor mat for the floor area of an automobile, wherein said automobile utilizes a floor accelerator manipulatable by a foot of a driver of the automobile, said mat comprising:

a mat having a top and bottom and configured to be received on the floor area used by the feet of the driver of the automobile;

a footrest having a top and a bottom, said top adapted to received the driver's foot which is positioned opposite the accelerator such that said foot may be supported above



the floor of the automobile at a height and angle approximating the height and angle of the foot of the driver when manipulating the accelerator; and

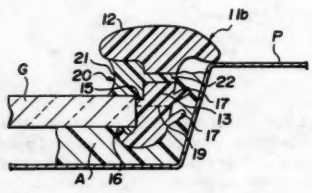
fixing means for detachably and simultaneously securing the footrest to the top of the mat and to the floor of the automobile such that the footrest cooperates with the fixing means to aid in the prevention of sliding of the mat along the surface of the floor of the automobile.

4,984,839

FRONT GLASS MOULDING FOR VEHICLE

Naohisa Miyakawa, and Katuhisa Kato, both of Kawarashi, Japan, assignors to Tokiwa Chemical Industries Co., Ltd., Chiba, Japan

Filed Jun. 9, 1988, Ser. No. 204,525
Int. Cl.[5] B60R *13/06*
U.S. Cl. 296—93 **11 Claims**



1. A moulding for the front glass pane of a vehicle comprising:

a substantially inverted U-shaped synthetic resin main moulding body, including a central section forming the bottom of the U-shape and side sections forming the sides of the U-shape and defining an interior portion therebetween, said side sections extending substantially right angles to said central section, wherein each said section comprises a head portion and a leg portion extending from said head portion at substantially right angles thereto; and

a synthetic resin auxiliary moulding body on each said side section of said main moulding body extending between said head portion of said side section and said front glass pane and engaging said front glass pane;

wherein said head portion of said central section comprises means defining a recess receiving the front glass pane, said leg portion of each said side section comprises at least one engaging means engaging said front glass pane, and each said auxiliary moulding body has a free and uncovered

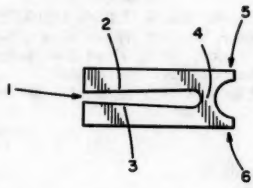
concave curved surface facing said interior portion of said substantially U-shaped synthetic resin main moulding body.

4,984,840

ONE-PIECE SUNVISOR EXTENDER

Ronald C. Lansing, 30315 N. Oak Grove Ave., Libertyville, Ill. 60048

Filed Mar. 28, 1990, Ser. No. 500,565
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.6 1 Claim



1. A one-piece sunvisor extender for sliding over the exposed edges of a conventional sunvisor consisting of:

(a) a flat panel of flexible cellular material, substantially rectangular in shape,

(b) with an open ended internally angled slit running the full length into which the lower edge of the conventional sunvisor is inserted,

(c) and whose side opposite the slit is substantially concave,

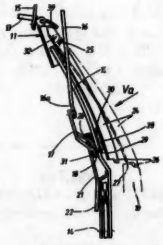
(d) whereby, when the concave edge is compressed, the one piece sunvisor extender may be moved about the sunvisor or removed completely.

4,984,841

FOLDING TOP FOR VEHICLES

Theodor Bauer, Altenriet; Gerhard Zweigart, Aidlingen, and Kurt Gramer, Nagold, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 25, 1988, Ser. No. 223,367
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 3724533
Int. Cl.[5] B60J *7/12*
U.S. Cl. 296—118 29 Claims



1. Folding top for vehicles with a top framework to be covered by a flexible roof skin, the top framework comprising:

a main bow having lateral struts, the main bow being pivotal about a vehicle transverse axis;

a main guide arm connected with each of the lateral struts of the main bow;

a roof skin retaining rail arranged laterally outside of each of the lateral struts for tightening the roof skin, each roof skin retaining rail being associated with one of the lateral struts of the main bow; and

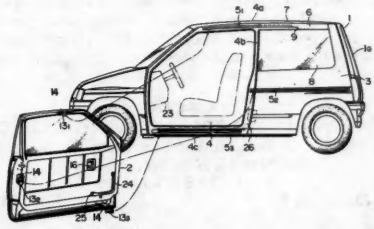
an automatic adjustment means associated with each of the roof skin retaining rails for moving an associated roof skin retaining rail between a stretching position spread apart from an associated lateral strut when the main bow is upright and in which position a lower end of the associated the roof skin retaining rail is juxtaposed to a respective side-board of associated vehicle structure and a folding position nearer the associated lateral strut in response to pivotal movement of the main bow toward a rear of the vehicle, each of the adjustment means being arranged independently of each of the respective side-boards and being forcibly controlled utilizing relative movement between each of the lateral struts of the top and the associated main guide arms taking place during pivoting of the main bow.

4,984,842

CAR PROVIDING A SLIDING DOOR

Fumihiko Ogawa, Hamamatsu; Kazunobu Hori, Kosai; Keiichi Asai, and Tomoyoshi Watanabe, both of Hamamatsu, all of Japan, assignors to Suzuki Motor Company Limited, Kamimura, Japan

Filed Aug. 23, 1989, Ser. No. 398,840
Claims priority, application Japan, Aug. 29, 1988, 63-214684; Aug. 29, 1988, 63-214688; Aug. 29, 1988, 63-214690; Sep. 6, 1988, 63-222643; Sep. 6, 1988, 63-222647; Sep. 6, 1988, 63-222648
Int. Cl.[5] B60J *5/06*
U.S. Cl. 296—155 5 Claims



1. A car assembly, comprising a vehicle body defining a front door opening and including a rear panel positioned rearwardly of said front door opening; guiderails mounted adjacent said front door opening; a sliding door positioned to engage said front door opening, said sliding door carrying roller assemblies, each roller assembly engageable with one of said guide rails for opening and shutting said sliding door; and, sliding regulation means for regulating a sliding amount of said sliding door to prevent said sliding door from sliding beyond a rear end of said rear panel, said slide regulating means including an auxiliary handle positioned connected to an inner side of said sliding door, said auxiliary handle being independent of an inside door locking handle.

4,984,843

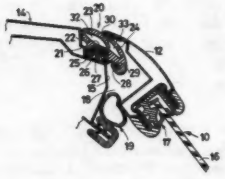
AUTOMOBILE SEAL AND TRIMMING GASKET

Ezio Villa, Milan; Giuseppe Biazzi, Varese, and Giorgio Guelfi, Milan, all of Italy, assignors to Alfa Lancia S.p.A., Milan, Italy

Continuation of Ser. No. 230,199, Aug. 9, 1988, abandoned. This application Nov. 30, 1989, Ser. No. 445,115
Claims priority, application Italy, Aug. 14, 1987, 21666 A/87
Int. Cl.[5] B60R *13/06*
U.S. Cl. 296—213 5 Claims

1. A profiled sealing and trimming gasket for an automobile having a sheet metal roof defining a contour, said gasket being

used to fill in gaps and spaces between door frames and door edges of the automobile, said gasket having an overall section, said section comprising a fixing web portion and two wings, said web portion having a recessed surface remote from said wings for engagement by mounting means, each wing having a curved section, each wing having a pair of spaced ends with the curved section positioned between the spaced ends, one of the spaced ends of each wing being attached to a side of said web portion whereby said wings are positioned opposite one another, the other of the spaced ends of each wing having a projecting lip, a first of said wings having an inner portion of its curved section positioned above said fixing web portion, a



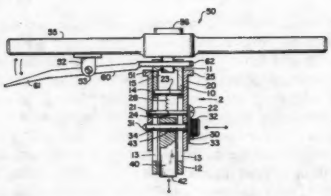
second of said wings having an inner portion of its curved section positioned at an angle to said web portion and spaced from the projecting lip of said first wing when said gasket is in an unloaded condition when the door of the automoibile is in an open position, the projecting lip of said second wing engaging the edge of the door in a loaded condition when the door is in a closed position and the door edge also contacting a portion of said first wing in the loaded condition wherein the projecting lip of said first wing is overlapped by said second wing, said second wing having its curved section protruding above a lateral extension of the roof contour when the door is in the open position and lying below the roof contour extension when the door is in the closed position.

4,984,844

SAFETY KEY FOR TOOLROOM LATHE CHUCK

Haig Tekeyan, 24 Doty St., Waltham, Mass. 02154

Filed May 16, 1988, Ser. No. 194,486
Int. Cl.[5] B25B *13/44*
U.S. Cl. 279—1 K **24 Claims**



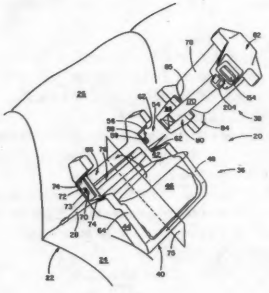
1. A safety key comprising:
a housing having a top end, a bottom end, and an internal passageway opening on said bottom end and extending towards said top end;
a sleeve concentrically surrounding said housing and axially slidable thereon between a first position and a second position;
a handle fixed to and extending transversely from said top end of said housing;
a key member sized to be movably received in said internal passageway at said bottom end of said housing;
securing means for securing said key member to said sleeve;
spring means for biasing said sleeve into its said first position when no axially downward pressure is applied to said sleeve, whereby said key member will be substantially completely withdrawn into said internal passageway of said housing; and
a lever comprising a first end, a second end, and a pivot located between said first end and said second end, said pivot being attached to said handle, said second end of said lever engaging said sleeve so that when said first end of said lever is moved towards said handle, said second end of said lever will move away from said handle and force said sleeve axially downward along said housing from its said first position towards its said second position so that a portion of said key member will protrude from said housing.

4,984,845

VEHICLE SEAT FOR A CHILD

Roy E. Knoedler, Boulder; William G. Au, Northglenn, and Robert M. Parker, Aurora, all of Colo., assignors to Gerry Baby Products Company, Denver, Colo.

Filed Apr. 14, 1989, Ser. No. 338,299
Int. Cl.[5] A47D *1/10*
U.S. Cl. 297—250 **9 Claims**



1. A car seat for a child comprising:
a seat portion adapted to support the child;
first means for restraining the child, said first means including a barrier having a first longitudinal axis as well as first and second support members extending downwardly relative to said barrier, said first and second support members being detachably coupled to said seat portion; and
a belt having a portion with a second longitudinal axis, said portion of said belt extending from said first support member to said second support member, said portion of said belt underlying said barrier, and said portion of said belt being spaced from said barrier wherein, when the child is secured within the car seat using said first means, said second longitudinal axis of said portion of said belt is substantially parallel to said first longitudinal axis of said barrier and a substantial portion of said portion of said belt is positioned adjacent to and across a substantial portion of the child's lap.

4,984,846

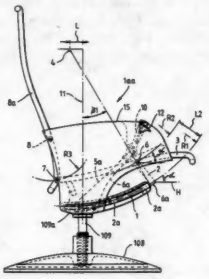
ARRANGEMENT IN AN ADJUSTABLE CHAIR

Jostein Ekornes, Ikornnes, Norway, assignor to J. E. Ekornes A/S, Norway

PCT No. PCT/NO88/00079, § 371 Date Jun. 16, 1989, § 102(e) Date Jun. 16, 1989, PCT Pub. No. WO89/03648, PCT Pub. Date May 5, 1989
PCT Filed Oct. 14, 1988, Ser. No. 372,381
Claims priority, application Norway, Oct. 19, 1987, 874362
Int. Cl.[5] A47C *1/02*
U.S. Cl. 297—317 **13 Claims**

1. A device in a chair having a back member, a seat member, frame means for supporting said back and seat members, fixed pivot means between said back and said frame means for

mounting said back member for pivotal movement thereabout, slide means between said frame means and said seat member for mounting said seat member for sliding forward and rearward in substantially horizontal positions, first articulation means comprising first movable pivot means for pivotally interconnecting said back and seat members for altering the relative angular positions therebetween from and to erected and recline positions and for pivoting said back member between vertical and rearwardly inclined positions with said first movable pivot means movable along a radius fixed by said



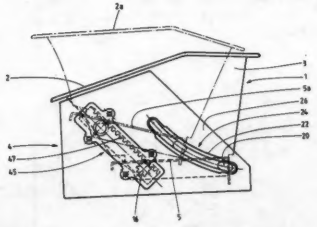
fixed pivot means and said slide means the improvement in which said slide means comprises curved sliding means mounted below said seat member a predetermined distance, second articulation means comprising second movable pivot means interconnecting said curved sliding means and said seat member for altering the relative angular positions therebetween and for pivoting said seat member along said substantially horizontal positions with said slide means moving along a radius larger than the radius along which said first articulation means moves.

4,984,847

MOVABLE ARM REST WITH MOTORISED ADJUSTMENT

Guy Bedu, Nogent-Sur-Vernisson, and Jean-Pierre Chabanne, Montargis, both of France, assignors to Tubauto, Levallois-Perret, France

Filed Jun. 6, 1989, Ser. No. 362,109
Claims priority, application France, Jun. 6, 1988, 8807876
Int. Cl.[5] A47C 7/54
U.S. Cl. 297—411 **13 Claims**



1. A movable arm rest positioned adjacent at least one seat of a vehicle, comprising:

a fixed frame stationarily positioned in a vehicle adjacent a seat and independently of the seat thereof;

a movable component having an upper part forming an arm support surface;

means for mounting said movable component on said fixed frame for movement independent of said seat between an up position in which said support surface is positioned to support an arm of an occupant of the seat, and a down position in which said support surface is retracted downward with respect to the up position, wherein said means for mounting comprise:

(a) support means mounted to said movable component, and

(b) guide means in said fixed frame, said guide means being inclined with respect to the horizontal direction and said guide means guiding said support means during movement of said movable component between said up and down positions; and

motor means fixed with respect to the movable component for continuously moving said movable component between said up and down positions,

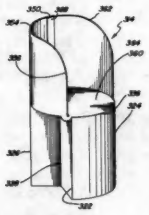
whereby said arm rest may be adjusted to a use position between said up position and said down position.

4,984,848

COLLAPSIBLE DISPOSABLE CHAIR

Phillip M. Scalisi, 5871 Furnace Creek Rd., Yorba Linda, Calif. 92686, and Joseph F. Scalisi, 808 N. Lorri Way, Walnut, Calif. 91789

Filed Dec. 7, 1988, Ser. No. 280,900
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] A47C 4/00
U.S. Cl. 297—440 **11 Claims**



1. A blank for a chair, comprising:

a sheet of material having thickness, a substantially straight bottom edge, an outermost top edge opposite thereto, and two free ends joining the bottom and outermost top edges, the sheet having three panels defined by two panel cut lines terminating adjacent two panel fold lines to define a central panel, and two end panels;

an intermediate fold line in two of said panels, said intermediate fold lines having an adjacent fold line on both sides of said intermediate fold line, said intermediate fold lines and said adjacent fold lines extending from the bottom edge toward the outermost top edge, being oriented substantially perpendicular to the bottom edge, and terminating at an end point, two of said adjacent fold lines comprising said two panel fold lines;

a pair of intermittent cut lines extending through the thickness of the sheet of material, the cut lines being spaced apart from, but running substantially parallel to the bottom edge, each of the cut lines extending from each of said intermediate fold lines to the two adjacent fold lines to such an extent that said intermediate fold lines can be repositioned with respect to said adjacent fold lines;

a seat fold line substantially parallel to the bottom edge, located adjacent each intermittent cut line and extending across a sufficient portion of the central panel to allow a seat portion located intermediate the seat fold line and the outermost top edge of the central panel to fold about said seat fold line; and

a connecting area along at least a portion of one of the free

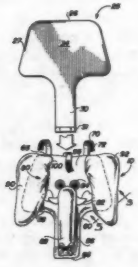
ends shaped to cooperate with a corresponding area on the opposite free end in order to allow the sheet of material to be joined into a continuous loop.

4,984,849

COVER FOR AUTOMOTIVE SEAT RESTRAINT SHIELD

Judith A. Rist, 11725 N. 83rd Pl., Scottsdale, Ariz. 85260

Filed Aug. 3, 1989, Ser. No. 389,344
Int. Cl.[5] A47C *1/08*; A47D *13/08*
U.S. Cl. 297—482 5 Claims



1. A cover for a frontal shield of an infant vehicle seat restraint comprising:

(a) a front and rear panel defining an opening configured so that the cover may be slipped over the shield with an outer surface of the front panel exposed;

(b) decorative indicia in the form of a fanciful design of a face on the outer surface of said front panel;

(c) a portion of said cover located in an area convenient to the grasp of the restrained infant including projections representative of ears associated with said face; and

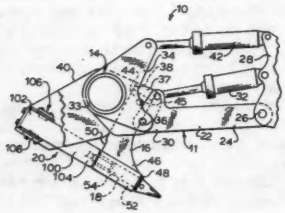
(d) said ear-like projections having a surface which is relatively smooth and another surface which is relatively rough defining a pocket-like construction, said pocket containing a material which crinkles to provide tactile and audible response when compressed.

4,984,850

LINEAR IMPACT RIPPER APPARATUS

Brian D. Jensen, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Nov. 2, 1989, Ser. No. 430,544
Int. Cl.[5] E21C *3/04*; B25D *17/24*
U.S. Cl. 299—37 7 Claims



1. An impact ripper apparatus comprising:

a mounting frame;

a tool holder having a first end portion attached to the mounting frame and a second end portion projecting therefrom, the second end portion having a bore therethrough;

a linear ram reciprocatingly supported within the bore; and

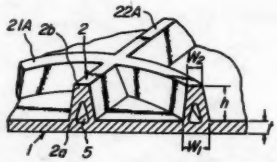
an impact hammer having a piston coaxially aligned with the bore, a first end portion resiliently mounted to the mounting frame, and a second end portion mounted on one of the linear ram and the second end portion of the tool holder, the impact hammer being positioned for the piston to deliver impact blows to the linear ram.

4,984,851

WHEEL COVER FOR AUTOMOBILES

Koichiro Hayano, Yokohama, Japan, assignor to Hashimoto Forming Industry Co., Ltd., Yokohama, Japan

Filed Oct. 24, 1989, Ser. No. 425,877
Claims priority, application Japan, Oct. 31, 1988, 63-142385[U]
Int. Cl.[5] B60B *7/02*
U.S. Cl. 301—37 P 8 Claims



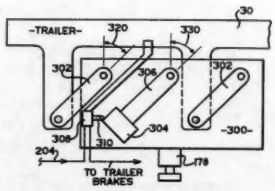
1. A wheel cover for automobiles, comprising a substantially dish-like main body which is composed of a thermoplastic synthetic resin material, said main body having axial front and rear surfaces and a thickness measured therebetween, said rear surface having reinforcing ribs formed integrally with and projecting axially rearwardly from said main body, at least one of said reinforcing ribs having a bottom portion adjacent to said rear surface of the main body, said bottom portion having means for preventing a sink mark on said front surface of said wheel cover, said means comprising a hollow cross-section and having a width which is greater than said thickness of the main body.

4,984,852

TRAILER MOUNTED TRACTOR-TRAILER BRAKE CONTROL SYSTEM

Joseph H. McNinch, Jr., Livonia, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 43,009, Apr. 27, 1987, Pat. No. 4,818,035. This application Jul. 31, 1987, Ser. No. 80,279
Int. Cl.[5] B60T *8/00*, *7/20*
U.S. Cl. 303—15 4 Claims



1. A method for controlling the brake system on a tractor-trailer vehicle having a fifth wheel/king pin connecting structure and individually controllable tractor and trailer sub-vehicle brake systems, said method characterized by;

(a) sensing from a location on said trailer sub-vehicle the

value of a parameter indicative of the vertical force exerted on the fifth wheel king pin/connection;

(b) sensing from a location on said trailer sub-vehicle the value of a parameter indicative of the horizontal force exerted by the king pin on the fifth wheel;

(c) sensing from a location on said trailer sub-vehicle the value of a parameter indicative of the acceleration of the vehicle;

(d) modulating the braking forces exerted by the trailer sub-vehicle brake system only to minimize the value of the expression;

$$E = a\ function\ of\ (H_F/V_F)[^{\circ}C] + a$$

where:

E=error;

H_F=horizontal force at fifth wheel/king pin connection;

V_F=load on fifth wheel; and,

a=forward acceleration of vehicle (expressed in units of gravity).

4,984,853

BRAKING CORRECTOR GOVERNED BY THE HEIGHT OF A VEHICLE

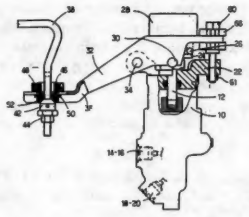
Alain Thioux, Bry Sur Marne, and Roland Levrai, Stains, both of France, assignors to Bendix Europe Services Techniques, Drancy, France

Filed Jan. 16, 1990, Ser. No. 465,681

Claims priority, application France, Jan. 31, 1989, 89 01155

Int. Cl.[5] B60T *8/22*

U.S. Cl. 303—22.8 **2 Claims**



1. A braking corrector governed by the height of a vehicle, comprising a body in which is slideably mounted at least one piston controlled by an actuating rod and arranged so as to interact with at least one valve element in order to control at least one brake-fluid passage between at least one inlet and at least one outlet of the corrector, the corrector including a sensor detecting the height of the vehicle and formed from a lever the pivot of which is stationary relative to the body of the corrector and one end of which is connected to an unsuspected part of the vehicle, a distance between the one end and the pivot defining a first lever arm, and the lever, which actuates the actuating rod at a distance from the pivot, defining a second lever arm, said corrector further including means for varying the ratio between the lengths of the first and second lever arms, the means for varying the ratio between the lengths of the first and second lever arms provided at the one end of the lever connected to the unsuspended part of the vehicle, the one end of the lever having a longitudinal aperture receiving initially slideably a washer which is secured selectively in position in the aperture to define the length of the first lever arm, the washer having an annular groove disposed in registry with the longitudinal aperture, a tubular piece connected with said washer, the washer and tubular piece having passing therethrough a rod connected to the unsuspended part of the vehicle, a nut attached to the rod and having a hemispherical part mated with a hemispherical recess of the tubular part, the washer secured in position in the aperture by means of set-in deformations made at edges of the aperture and adjacent the washer.

4,984,854

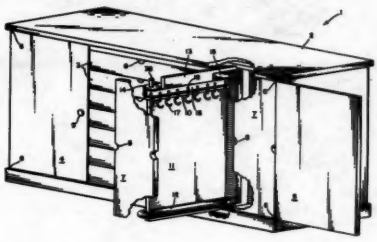
JEWELRY BOX

Annette DeLavallade, 35 Leaf Rd., Delmar, N.Y. 12054

Filed Aug. 18, 1989, Ser. No. 395,534

Int. Cl.[5] A47B *88/00*

U.S. Cl. 312—330.1 **18 Claims**



1. A jewelry box comprising:

an outer box structure;

at least one horizontally oriented drawer slidably received in said box structure, said horizontally oriented drawer providing a flat storage area for jewelry;

at least one vertically oriented drawer also slidably received in said box structure, said vertically oriented drawer providing a storage area where jewelry can be hung,

said at least one vertically oriented drawer comprising a top portion, middle portion, and bottom portion,

said top portion comprising a guide means which engages a receiving means operatively connected to an inner surface of said box structure, said guide means functioning to guide the drawer when it slides in or out of said box structure,

said top portion of said vertically oriented drawer also comprising a band and pulley system for moving jewelry around a perimeter of said top portion, said band and pulley system comprising a horizontally oriented band means movably supported by at least two pulleys that are rotatably mounted on support means located on said drawer top portion, and

a plurality of hook means mounted on said band means for hanging jewelry therefrom.

4,984,855

ULTRA-BLACK FILM AND METHOD OF MANUFACTURING THE SAME

Masao Horiuti; Shunichi Kodama, both of Tokyo, and Kenji Kuroda, Hadano, all of Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Nov. 8, 1988, Ser. No. 268,509

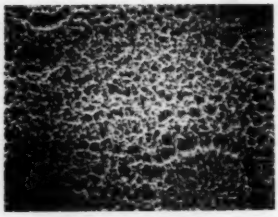
Claims priority, application Japan, Nov. 10, 1987, 62-283878; Jan. 9, 1988, 63-2914; Feb. 27, 1988, 63-45569; Sep. 16, 1988, 63-231760; Sep. 16, 1988, 63-231761; Sep. 30, 1988, 63-244228; Sep. 30, 1988, 63-127194[U]; Sep. 30, 1988, 63-127195[U]

Int. Cl.[5] G02B *5/22*

U.S. Cl. 350—1.1 **10 Claims**

1. An ultra-black film comprising a base made of a material selected from a group consisting of electric conductors and non-conductors, a nickel-phosphorus alloy layer formed on said base and a phosphate layer formed on said nickel-phosphorus alloy layer, the spectral reflectance of said ultra-black film in a wave-length range of 380 to 1,800 nm being 0.04 to

0.4% and the surface of said ultra-black film has innumerable conical holes with opening diameters ranging from 1 to 6 μm



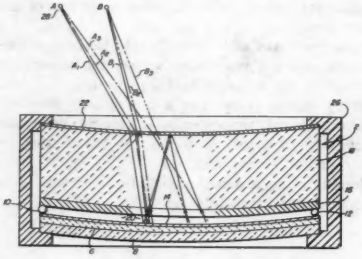
and close to one another, the surfaces of said conical holes being fluffy.

4,984,856

HOLOGRAPHIC EXPOSURE SYSTEM TO REDUCE SPURIOUS HOLOGRAM NOISE

Gaylord E. Moss, Marina del Rey, and John E. Wreede, Monrovia, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 31, 1989, Ser. No. 401,327
Int. Cl.[5] G03H 1/20
U.S. Cl. 350—3.67 23 Claims



6. An improved exposure system for the production of holograms from a reference member, comprising:

a beam of coherent energy compatible with recording a hologram;

a master reference member having reflective properties to the beam of energy;

means for directing the beam of energy at the master reference member;

a substrate having an inner and outer surface;

a recording medium positioned on the inner surface of the substrate adjacent the master reference member, and

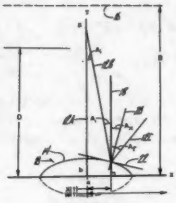
means for causing a predetermined phase shift within an approximate range of 0.05 cycles in the beam of energy as it contracts and records an interference pattern in the recording medium whereby fringes of any holographic noise, such as cause by reflections of a reflected beam of energy from the outer substrate surface, are blurred.

4,984,857

LINEARIZATION OF SCAN VELOCITY OF RESONANT VIBRATING-MIRROR BEAM DEFLECTORS

Edward S. Yeung, Ames, Iowa, and Shun-Le Chen, Long Island City, N.Y., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jan. 17, 1989, Ser. No. 297,483
Int. Cl.[5] G02B 26/10, 5/10
U.S. Cl. 350—6.6 20 Claims



1. A means for linearization of scan velocity of a resonant vibrating-mirror beam deflector where an energy beam is directed along a beam path to a deflector means including a resonating mirror having a rotational axis for deflecting a first reflected portion of the beam in a plane normal to the rotational axis for scanning the beam along a scan line, the improvement comprising:

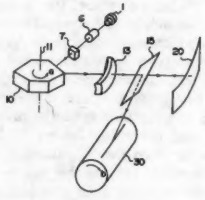
a beam path altering means positioned in the beam path following the resonating mirror for linearizing scan velocity in a focal plane, the altering means comprising an elliptical surface having a major and minor axis and being disposed in such a manner that the minor axis of the elliptical surface is coaxial with a line in normal alignment to the mirror, the elliptical surface being shaped to maximize the linearity between positions of a second reflected portion of the beam along the scan line in relationship to time.

4,984,858

LIGHT BEAM SCANNING OPTICAL SYSTEM

Muneo Kuroda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 3, 1989, Ser. No. 306,583
Claims priority, application Japan, Feb. 4, 1988, 63-25411; Mar. 15, 1988, 63-62154
Int. Cl.[5] G02B 26/10
U.S. Cl. 350—6.8 12 Claims



1. A light beam scanning optical system, comprising:

a light source means for emitting a modulated luminous flux;

a luminous flux converging means for converging said modulated luminous flux emitted from the light source means into a straight line in the direction parallel to a deflection plane;

a deflection device disposed in the vicinity where said luminous flux is converged into said straight line for deflecting the converged luminous flux at an equiangular velocity;

a cylindrical mirror for collecting luminous flux from the deflection device and turing said collected luminous flux onto the surface of a photoconductor; and

a toroidal lens disposed between the deflection device and the cylindrical mirror in optical alignment therewith.

4,984,859

OPTICAL FIBER RIBBON END-STRUCTURE

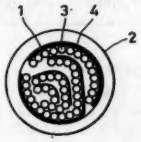
Takashi Fujigaki, Kanagawa; Yoshikazu Fujinaga, Aichi; Shuichiro Tokuda, Aichi; Noriyuki Furukawa, Aichi; Kiyoshi Ichimura, Tokyo; Yukio Shibuya, Tokyo, and Shigeru Iuchi, Tokyo, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 206,066, Jun. 13, 1988, abandoned. This application Feb. 16, 1990, Ser. No. 480,991

Claims priority, application Japan, Jun. 19, 1987, 62-93352[U]

Int. Cl.[5] G02B *6/04*

U.S. Cl. 350—96.24 **6 Claims**



1. An end structure for at least one optical fiber ribbon, said at least one optical fiber ribbon comprising a plurality of optical fibers which are arranged in the form of a tape and having a coating layer on one side of said tape for holding them together, wherein the same-side end of said at least one optical fiber ribbon is bundled together and tightly fitted in a metallic sleeve member so that the inner surface of said metallic sleeve member is adjacent to only said coating layer of said at least one optical fiber ribbon, and said coating layer of each optical fiber ribbon is adjacent to at least one of said inner surface of said metallic sleeve member, a non-coating layer side of said tape comprising said at least one optical fiber ribbon, and a non-coating layer side of another optical fiber ribbon.

4,984,860

OPTICAL FIBER-CONTAINING INSULATORS AND PRODUCING PROCESS THEREOF

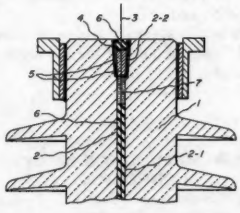
Shoji Seike; Toshiyuki Mima, both of Nagoya, and Koichi Mori, Handa, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Dec. 6, 1989, Ser. No. 446,680

Claims priority, application Japan, Dec. 6, 1988, 63-306960

Int. Cl.[5] G02B *6/00, 6/14, 6/26;* H01B *17/00*

U.S. Cl. 350—96.10 **2 Claims**



1. An optical fiber-containing insulator, comprising:

an insulator body having a through hole provided at a central axis portion thereof, said through hole having a wide mouthed portion arranged at each end portion of said insulator body;

an optical fiber disposed in said through hole;

an electrically conductive cylindrical member disposed within each said wide mouthed portion of said through hole;

an inorganic glass disposed around said optical fiber in each said cylindrical member and between an inner surface of each said wide mouthed portion and an outer surface of each said cylindrical member;

an insulation gas or an organic insulation material filled in said trough hole in a middle portion of said insulator body; and

a heat resistive adhesive agent member disposed between said insulation gas or organic insulation material and each said cylindrical member.

4,984,861

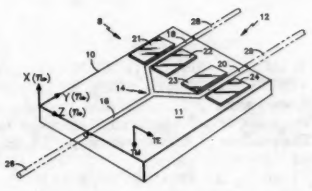
LOW-LOSS PROTON EXCHANGED WAVEGUIDES FOR ACTIVE INTEGRATED OPTIC DEVICES AND METHOD OF MAKING SAME

Paul G. Suchoski, Jr., East Hartford; Talal K. Findakly, and Frederick J. Leonberger, both of Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 27, 1989, Ser. No. 329,123

Int. Cl.[5] G02B *6/12, 6/26;* H01L *21/265*

U.S. Cl. 350—96.11 **22 Claims**



1. An active integrated optic (IO) device, comprising:

a crystalline material substrate, having a major surface; and

an IO circuit array, including an optical waveguide array and an electrode array disposed in juxtaposition on said major surface to provide one or more IO regions thereon;

as characterized by:

said optical waveguide array being formed in said major surface by a two step proton exchange (TSPE) process comprising the steps of:

immersing said substrate, for a period of from two to sixty minutes, in a benzoic acid bath at a temperature of from 150° C. to 250° C.; and

annealing said substrate for a period of from one to five hours at a temperature of from 300° C. to 400° C.

18. The method of fabricating proton exchanged (PE) IO devices, comprising the steps of:

preparing a crystalline material substrate to provide a major surface thereon;

etching channels in said major surface to produce a selected IO device waveguide geometry thereon;

immersing the substrate in benzoic acid at a bath temperature in the range of from 150° C. to 250° C. for a period of from two to sixty minutes, and then removing the substrate; and

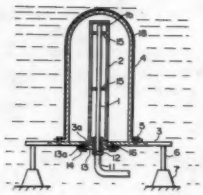
annealing the substrate at a temperature in the range of from 300° C. to 400° C. for a period of from one hour to five hours.

4,984,862

LIGHT RADIATOR FOR THE CULTIVATION OF FISH

Kei Mori, 3-16-3-501, Kaminoge, Setagya-ku, Tokyo, Japan

Filed Dec. 4, 1989, Ser. No. 445,236
Claims priority, application Japan, Jan. 9, 1989, 1-2238; Jul. 28, 1989, 1-196060
Int. Cl.[5] G02B 6/00, 6/14
U.S. Cl. 350—96.10 10 Claims



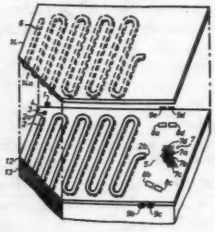
1. A light radiator device which is useable underwater for cultivating fish, comprising a light guide having an end portion through which light rays are introduced and having a peripheral surface through which light rays are emitted, a transparent first container for hermetically accommodating said light guide such that light rays emitted from said light guide pass through said first container, and a semi-transparent second container for hermetically accommodating said first container such that light rays emitted from said light guide and passing through said first container pass through said second container into the surrounding water in which said light radiator is disposed.

4,984,863

FORCE METER WITH OPTICAL WAVEGUIDE INTEGRATED IN A SUBSTRATE

Olivier Parriaux, Lausanne; Victor Neuman, Corcelles, and Guy Voirin, Neuchâtel, all of Switzerland, assignors to Centre Suisse d'Electronique et de Microtechnique SA, Neuchatel, Switzerland

Filed Sep. 21, 1989, Ser. No. 410,520
Claims priority, application France, Sep. 23, 1988, 88 12433
Int. Cl.[5] G02B 6/12
U.S. Cl. 350—96.11 5 Claims



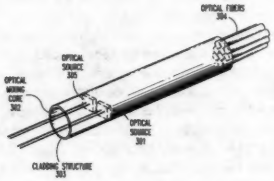
1. An optical waveguide force meter, comprising:
a base plate member;
a substrate member provided on said base plate member;
a birefringent single-mode optical waveguide formed on said substrate member, said waveguide having an entry end and an exit end;
a single-mode laser source supported by said substrate member and said base plate member at a position adjacent the entry end of said optical waveguide;
a focussing coupling grating provided on said substrate member at a position interposed between said laser source and the entry end of said optical waveguide;
a coupling/mixing grating provided on said substrate member at a position adjacent the exit end of said optical waveguide, said coupling/mixing grating comprising N concave focussing gratings;
N TM polarization filters provided on said substrate member in a region adjacent the exit end of said optical waveguide and said coupling/mixing grating;
N detectors supported by said substrate and said base plate member in a region adjacent said TM polarization filters; and
a load plate provided on said optical waveguide;
wherein said coupling/mixing grating spatially separates an incident light wave exciting said optical waveguide into N diffracted waves, focusses the N diffracted waves onto said detectors, and effects a conversion of incident polarization modes TE_i and TM_i of said incident light wave exciting said optical waveguide into diffracted modes with energy equally distributed between TE_d, and $TE_{d'}$ modes, N being an integer number equal to or greater than 2.

4,984,864

OPTICAL SPLITTER HAVING A SELF-CONTAINED OPTICAL SOURCE

Lee L. Blyler, Jr., Basking Ridge, N.J., and Gary J. Grimes, Thornton, Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 21, 1989, Ser. No. 454,085
Int. Cl.[5] G02B 6/28; H04J 1/00
U.S. Cl. 350—96.16 12 Claims



1. An optical device for distributing optical signals to a plurality of optical fibers connected to said optical device, and said optical device comprising;
a rigid structure forming an optical cladding;
an optical core formed within said rigid structure;
a radiation source embedded in said optical core for transmitting radiation energy to each of said plurality of optical fibers;
the numerical aperture of said optical core being within about 20% of both the numerical aperture of said plurality of said optical fibers and the numerical aperture of said radiation source; and
total core cross-sectional area of said optical fibers matching within a minimum of 50% of the cross-sectional area of said optical core.

4,984,865

THERMOPLASTIC ADHESIVE MOUNTING APPARATUS AND METHOD FOR AN OPTICAL FIBER CONNECTOR

Nicholas A. Lee, Woodbury, and James E. Toonen, Burnsville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 17, 1989, Ser. No. 439,095
Int. Cl.[5] G02B 6/26; B31B 1/60; B29D 11/00
U.S. Cl. 350—96.20 19 Claims

1. An optical fiber connector containing a thermoplastic adhesive by which an optical fiber can be mounted, which

thermoplastic adhesive comprises a thermoplastic resin and is characterized by

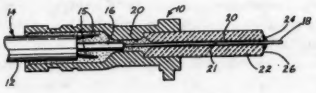
(a) a viscosity of between 1000 and 10,000 cp at a suitable working temperature not harmful to the connector,

(b) an Adhesion-to-Glass Value of at least 10N, and

(c) a Shore D hardness of at least 60° at 20° C.

13. Method of mounting an optical fiber in a connector, said method comprising the steps of

(1) inserting into the connector a thermoplastic adhesive that is characterized by



(a) a viscosity of between 1000 and 10,000 cp at a working temperature not harmful to the connector,

(b) an Adhesion-to-Glass Value of at least 10N, and

(c) a Shore D hardness of at least 60 at 20° C.

(2) inserting an optical fiber into the connector;

(3) heating to soften the adhesive to flow into contact with the optical fiber; and

(4) cooling to harden the adhesive around the optical fiber to provide a mount for the fiber.

4,984,866

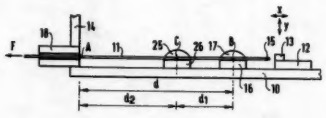
COUPLING DEVICE BETWEEN IN OPTICAL FIBER AND AN OPTO-ELECTRONIC COMPONENT

Jean Marc Boisgontier, Les Essarts le Roi, and Christian Caville, Paris, both of France, assignors to Societe Anonyme dite: Alcatel CIT, Paris, France

Continuation of Ser. No. 269,399, Nov. 10, 1988, abandoned. This application May 18, 1990, Ser. No. 525,206

Claims priority, application France, Nov. 13, 1987, 87 15689

Int. Cl.[5] G02B *6/36, 7/26*

U.S. Cl. 350—96.20 **9 Claims**

1. A coupling device between an optical fiber and an opto-electronic component in the form of a chip of semiconductor material comprising, in addition to said optical fiber and said opto-electronic component, a housing containing said component and into which said fiber penetrates through a wall, with one end of the fiber coming into optical coupling with the chip of semiconductor material, and means for holding the optical fiber, by fixing it to the housing, at least three spaced holding points, said holding points comprising a rear holding point placed directly on the optical fiber in the vicinity of its end which is optically coupled with the chip of semiconductor material in order to hold said end in its coupling position, a front holding point placed directly on the optical fiber where it passes through the wall of the housing in order to withstand forces exerted on the optical fiber from outside the housing, and at least one intermediate holding point placed directly on the optical fiber between the rear holding point and the front holding point in order to attenuate the transmission to the rear holding point of the forces exerted on the fiber at the front holding point by deformation on the housing.

4,984,867

CONNECTOR FOR OPTICAL FIBER CONDUCTORS

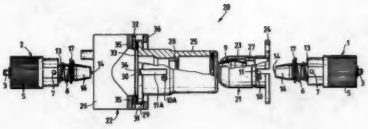
Marco D. Giovanna, Paderno Ponchielli, Italy, assignor to Sirti S.p.A., Milan, Italy

Filed Jan. 30, 1990, Ser. No. 472,252

Claims priority, application Italy, Feb. 3, 1989, 19312 A/89

Int. Cl.[5] G02B *6/26, 6/36*

U.S. Cl. 350—96.21 **5 Claims**



1. A connector (20) for a optical fiber conductors each having an end section, said connector comprising a female element (22) housed within a fixed unit and a male element housed within a moveable unit, said movable unit being moveable towards said fixed unit whereby said female and male elements are coupled together connecting the end sections of at least one pair of optical fiber conductors (3) with each other, said connector (20) further comprising a first plug (1) and a second plug (2), said first and second plugs being identical to each other, each of said plugs housing the end section of one of said optical fiber conductors, said first plug being housed at a precise and predetermined angular position within said male element, said second plug being housed at a precise and predetermined position within said female element, said first and second plugs being positioned in mutually opposite positions and oriented along a common axis (15) of said connector whereby the consequent perfect coincidence and mutual superimposition of the end sections of said at least pair of optical fiber conductors results when said male element is coupled with said female element along said common axis, said female element (22) comprising a base (26) and a sleeve (25), said sleeve having means for positioning said sleeve with said base by a translational rotation of said sleeve on a plane perpendicular to said common axis of said connector, said sleeve positioning means preventing further rotation about said common axis of said connector, said sleeve further comprising a flange (29) provided with a first groove (30), said first groove being perpendicular to the common axis of said connector, and said base (26) comprising a flat housing (31) opposite to said flange, said flat housing having a second groove (32) being perpendicular to said first groove, an annular element (33) being interposed between said flange and said flat housing, said annular element comprising a first face and a second face, said first face supporting a first pair of keys (34) positioned at the end of a first diameter and engaging said first groove, said second face supporting a second pair of keys (35) positioned at the ends of a second diameter perpendicular to the first diameter and engaging said second groove, said flange being kept retained inside an interior of said flat housing by a counter-flange (36) fastened to said base.

4,984,868

OPTICAL CONNECTOR AND METHOD OF FORMING AN OPTICAL SPLICE

Eduardus F. A. ten Berge, Drunen, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 12, 1989, Ser. No. 364,940

Int. Cl.[5] G02B *6/38*

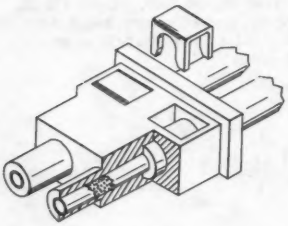
U.S. Cl. 350—96.21 **12 Claims**

1. A fibre optic connector for optical connection to a similar connector, comprising:

a housing of an optically isolating material having a through bore terminating to an end face;

an optical fibre situated within the through bore of the housing, the fibre having a finished and ground surface at the

free end which is adjacent to the end face of the housing, and an unfinished surface at the opposite free end which is within the interior of the through bore; and



a gel disposed within the through bore of the housing and proximate to the unfinished free end of the fibre.

4,984,869

OPTICAL FIBRE CABLE AND METHOD OF MAKING SAME

Gaston Roche, Riom, France, assignor to Satcables (Société en nom collectif), Paris, France

Filed Sep. 19, 1989, Ser. No. 409,563

Int. Cl.[5] G02B *6/44;* B05D *3/12;* D02G *3/36*

U.S. Cl. 350—96.23 **34 Claims**

1. A cable having at least one optical fibre, comprising strength members which are twisted along helicoidal lines of mutual contact, an outer coating covering the strength members and providing helicoidal reception spaces each of which is defined by the outer coating, two adjacent strenght members and their line of contact, characterised by the fact that the fibre extends in one of said helicoidal spaces and the length of the fibre is greater than the length of the contact line defining its reception space in order to provide an overlength and to permit variations in the length of the strength members.

18. A method of manufacturing a cable having at least one optical fibre comprising the steps of:

encasing the strength members with an outer coating covering the strength members such that helicoidal reception spaces are each defined by the outer coating, two adjacent strength members and their line of contact,

inserting said optical fibre in one of said helicoidal spaces with the length of the optical fibre being greater than the length of the contact line defining its reception space so as to provide an overlength and to permit variations in the length of the strength members, and

twisting the strength members along helicoidal lines of mutual contact.

4,984,870

OPTICAL WAVEGUIDE

Peter Herbrechtsmeier, Königstein/Taunus; Gerhard Wieners, Frankfurt am Main; Jürgen Kuhls, Burghausen; Manfred Tschacher, Emmerting, and Herbert Fitz, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 26, 1989, Ser. No. 344,236

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1988, 3814299

Int. Cl.[5] G02B *6/00*

U.S. Cl. 350—96.34 **8 Claims**

1. An optical waveguide having a core/sheath structure whose core comprises a polymer with a refractive index n(C) and whose sheath comprises a polymer with a refractive index n(S), where $n(C)/n(S) > 1.01$, wherein the core comprises a polycarbonate, or comprises a polymer which contains units selected from the group consisting of units which are derived from styrene, from a substituted styrene, from an acrylate, from a methacrylate or from a fluoroacrylate, and the sheath comprises a polymer which has been modified and crosslinked with 0.1 to 10% by weight, based on the unmodified polymer, of a trisalkoxyvinylsilane, and contains units which, based in each case on the unmodified polymer, are derived from 30 to 90% by weight of vinylidene fluoride and from 70 to 10% by weight of at least one other vinyl monomer containing fluorine.

4,984,871

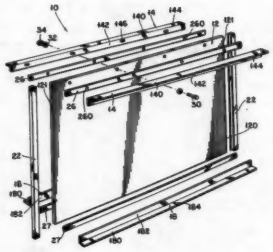
OPTICAL REAR PROJECTION SCREEN HANGER ASSEMBLY

Eugene Martinez, Woodbine Rd., Irvington, N.Y. 10533

Filed Dec. 7, 1989, Ser. No. 447,428

Int. Cl.[5] G03B *21/56*

U.S. Cl. 350—117 **21 Claims**



1. A hanging device for hanging an optical rear projection screen comprising:

means for securing a top portion of the screen;

means for non-rigidly restraining a bottom portion of the screen;

means for adjusting the screen in either a lateral or a longitudinal direction.

4,984,872

WIDE VIEWING ANGLE AVIONICS LIQUID CRYSTAL DISPLAY

Gerald L. Vick, Mount Vernon, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 16, 1989, Ser. No. 367,066

Int. Cl.[5] G02F *1/13;* H01J *1/62, 63/04*

U.S. Cl. 350—321 **8 Claims**

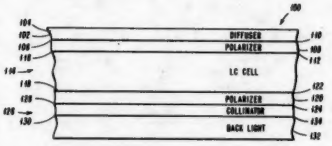
1. An avionics liquid display comprising:

a liquid crystal panel having a front planar surface and a back planar surface;

a front polarizer disposed upon the front planar surface of said liquid crystal panel;

a diffuser disposed on said front polarizer;

a back polarizer disposed on the back planar surface of said liquid crystal panel;



a planar collimator disposed on said back polarizer;

a diffuse back light emitting light incident upon said planar collimator.

4,984,873

LIQUID CRYSTAL DISPLAY DEVICE

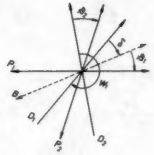
Yasuyuki Takiguchi, Kawasaki; Akihiko Kanemoto, Yokohama; Kenya Yokoi, Yokohama; Haruo Iimura, Yokohama; Takamichi Enomoto, Shiroyama, and Sumio Kamoi, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 31, 1988, Ser. No. 238,510

Claims priority, application Japan, Aug. 31, 1987, 62-217042; Nov. 10, 1987, 62-282078; Dec. 3, 1987, 62-307111; Apr. 27, 1988, 63-106039; Jun. 20, 1988, 63-151963

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—337 **1 Claim**



1. A liquid crystal display device, comprising:

(a) a liquid crystal layer disposed between a pair of light permeable substrates, an alignment of a liquid crystal of said liquid crystal layer being substantially horizontal relative to said substrates in the absence of applied voltage, said liquid crystal layer having a twisted structure with a twist angle along a direction of a thickness thereof such that an adequate display is provided without substantially reducing the time divisional driving;

(b) a pair of polarization means disposed on both outsides of said liquid crystal layer; and

(c) at least one birefringent medium layer disposed between one side of said liquid crystal layer and the polarization means on said one side of said liquid crystal layer;

an optical axis of said birefringent medium layer being inclined toward a polarization axis of the adjacent polarization means,

the alignment direction of said liquid crystal on a surface of another side of said liquid crystal layer making an angle from 0° to 25° relative to the polarization transmission axis or an absorption axis of the polarization means,

the direction of a maximum refractive index of said birefringent medium layer and the alignment direction of said liquid crystal on a surface of said one side of said liquid crystal layer making an angle 20° to 130° while a retardation of said birefringent medium layer is in a range of 0.125π rad to 1π rad and a retardation of said liquid crystal layer is about $3/2\pi$ rad or about 2π rad.

4,984,874

LIQUID CRYSTAL DISPLAY DEVICE HAVING RETARDATION FILMS

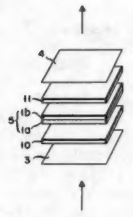
Tomiaki Yamamoto, Chigasaki; Akio Murayama, Kamakura; Susumu Kondo, Yokosuka; Hitoshi Hato, Yokohama; Shinichi Kamagami, and Shoichi Matsumoto, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 7, 1989, Ser. No. 376,653

Claims priority, application Japan, Jul. 8, 1988, 63-169011

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—334 **3 Claims**



1. A liquid crystal display device comprising:

(A) a liquid crystal cell including:

(a) first and second substrates arranged to oppose each other,

(b) first and second electrodes formed on opposing surfaces of said first and second substrates, respectively, and

(c) a liquid crystal composition filled between said first and second substrates and arranged in a twisted mode;

(B) first and second polarizers arranged on both sides of said liquid crystal cell;

(C) a first optical retardation film arranged between said first substrate and said first polarizer; and

(D) a second optical retardation film arranged between said second substrate and said second polarizer;

wherein said liquid crystal cell has a retardation value R0 of 0.4 to 0.85 μm, defined by an equation:

ti $\Delta n \cdot d \cdot \cos^2\theta$

where d is a distance between said first and second substrates, Δn is an optical anistropy of said liquid crystal composition and θ is a tilt angle of said liquid crystal composition; and

wherein a retardation value of each of said first and second optical retardation films falls within a range of R0×0.3 to R0×1.0.

4,984,875

OPTICAL COMPONENT AND MAGNETIC-FIELD SENSOR USING SUPERPOSED SINGLE CRYSTAL ELEMENTS HAVING DIFFERENT OPTICAL PROPERTIES

Hiroaki Abe, and Shuhei Toyoda, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jul. 25, 1989, Ser. No. 384,502

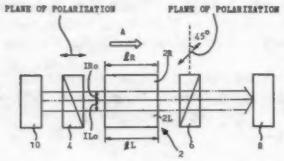
Claims priority, application Japan, Jul. 28, 1988, 63-188951

Int. Cl.[5] G02F *1/09*; G02B *1/02*

U.S. Cl. 350—377 **5 Claims**

1. An optical unit through which a light beam is propagated in a predetermined direction, comprising an optical component which includes at least one first single crystal element having a property of causing dextrorotation of a plane of polarization of said light beam propagated therethrough, and at least one second single crystal element having a property of causing levorotation of the plane of polarization of said light beam propagated therethrough, said first crystal element and said

second crystal element being in an adjacent, side-by-side relationship such that a contacting interface plane between said



first crystal element and said second crystal element is parallel to said predetermined direction of propagation of said light beam.

4,984,876

ZOOM LENS SYSTEM

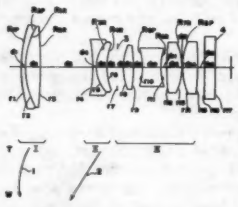
Kazuyoshi Hata, and Masami Tanaka, Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 15, 1988, Ser. No. 244,796

Claims priority, application Japan, Sep. 16, 1987, 62-231293; Sep. 16, 1987, 62-231294; Sep. 16, 1987, 62-231295; Sep. 16, 1987, 62-231296; Sep. 21, 1987, 62-236493; Sep. 21, 1987, 62-236494; Sep. 21, 1987, 62-236495; Sep. 30, 1987, 62-246222

Int. Cl.[5] G02B *15/00*

U.S. Cl. 350—423 39 Claims



1. A zoom lens system consisting of from the object side to the image side:

a first lens unit of a positive refractive power, consisting of a negative meniscus lens element having an object side surface convex to the object side, and a bi-convex lens element whose object side surface has stronger refractive power than its image side surface has;

a second lens unit of a negative refractive power, consisting of a negative lens element whose image side surface has a stronger refractive power than its object side surface has, and a positive meniscus lens element having an object side surface convex to the object side; and

a third lens unit of a positive refractive power;

wherein the second lens unit and one of the first and third lens units are shiftable along the optical axis of the lens system in the zooming operation while another thereof is stationary on the optical axis in the zooming operation.

4,984,877

HIGH ZOOM-RATIO/ZOOM LENS SYSTEM FOR USE IN A COMPACT CAMERA

Takayuki Ito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaishi, Tokyo, Japan

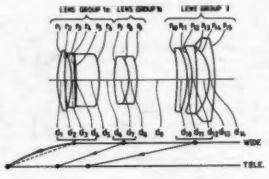
Continuation of Ser. No. 328,265, Mar. 24, 1989, abandoned. This application Jun. 8, 1990, Ser. No. 535,234

Claims priority, application Japan, Mar. 25, 1988, 63-71226

Int. Cl.[5] G02B *15/00*

U.S. Cl. 350—423 6 Claims

1. In a high zoom-ratio zoom lens system for use in a compact camera which comprises, in order from the object side, a first lens group having a positive focal length and a second lens group having a negative focal length, and which performs zooming by adjusting the distance between the two lens groups, the improvement wherein said first lens group com-



prises a first lens subgroup having a small power and a second lens subgroup having a positive focal length, the distance between said two subgroups being increased during zooming from a wide-angle end to a normal position and decreased during zooming from said normal position to a telephoto end.

4,984,878

OJECTIVE LENS FOR ENDOSCOPE

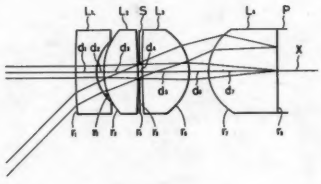
Hitoshi Miyano, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Aug. 8, 1989, Ser. No. 390,758

Claims priority, application Japan, Sep. 29, 1988, 63-242441; Apr. 5, 1989, 1-84719

Int. Cl.[5] G02B *9/34, 21/02*

U.S. Cl. 350—469 7 Claims



1. An objective lens for an endoscope, having a lens system consisting of four single lenses designated as first lens L_1, second lens L_2, third lens L_3 and fourth lens L_4 from the object side, wherein:

said first lens L_1 consists of a negative lens having a concave surface on the image side;

said second lens L_2 consists of a positive lens having a surface of a smaller radius of curvature on the object side;

said third lens L_3 consists of a positive lens having a surface of a smaller radius of curvature on the image side; and

said fourth lens L_4 consists of a positive lens;

said first to fourth lenses L_1 to L_4 of said lens system being arranged to satisfy the following conditions (1) to (4).

$$n_1 > 1.70,\ \nu_1 > 40.0, \quad (1)$$

$$\nu_3 < 42.5, \quad (2)$$

$$n_5 > 1.60,\ \nu_5 > 50.0, \text{ and} \quad (3)$$

$$n_7 > 1.60,\ \nu_7 > 50.0 \quad (4)$$

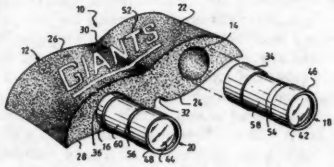
where n_1, n_5 and n_7 are refractive indices of said first lens L_1, third lens L_3 and fourth lens L_4 relative to line d, and γ_1, γ_3, γ_5 and V_7 are Abbe's numbers of said first lens L_1, second lens L_2, third lens L_3 and fourth lens L_4, respectively.

4,984,879

COMFORTABLE BINOCULAR

Richard A. Plunkett, 270 Clinton St., Brooklyn, N.Y. 11201

Filed Jan. 22, 1990, Ser. No. 468,108
Int. Cl.[5] G02B 7/09, 7/28, 23/00, 27/02
U.S. Cl. 350—551 17 Claims



1. A binocular, comprising:

(a) an outer cushion binocular structure containing a first hole and a second hole, said outer binocular structure has a top, a front, a rear, a bottom, and a substantial longitudinal center line, said outer bincoular structure further contains a nose relief being disposed on said bottom and at said substantial longitudinal center line so that said outer binocular structure sits on the bridge of the nose of the user for support and comfort, said outer binocular structure is durable, light weight, soft, and is die cut or mold made, said outer binocular structure is made of foam selected from the group of polyether foam, polyester foam, polyurethane foam, foam rubber, and styrofoam;

(b) a first telescopically adjustable lens means readily removably disposed in said first hole of said outer binocular structure, said first telescopically adjustable lens means and said second telescopically adjustable lens means are made of plastic; and

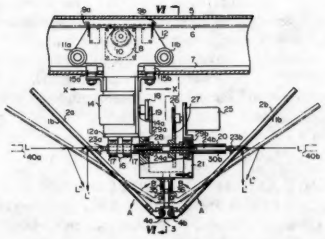
(c) a second telescopically adjustable lens means readily removably disposed in said second hole of said outer binocular structure, said first telescopically adjustable lens means and said second telescopically adjustable lens means being focused individually and separately from each other so as to be properly adjustable for users needing different magnifications for each eye.

4,984,880

LIGHT REFLECTING DEVICE WITH SYMMETRICALLY DISPOSED LIGHT REFLECTING PLATES

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Feb. 15, 1990, Ser. No. 480,405
Claims priority, application Japan, Jul. 31, 1989, 1-198791
Int. Cl.[5] G02B 7/198, 5/08, 17/00
U.S. Cl. 350—616 3 Claims



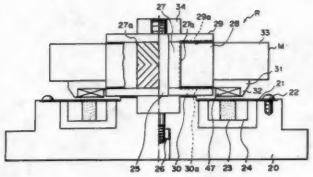
1. A light reflecting device for reflecting light from light sources, comprising a pair of light-reflecting plates, disposed symmetrically about the center axis and facing in the opposite directions, each of said plates being inclinably, rotatably and integrally mounted, a driving means for moving said pair of reflecting plates back and forth in the direction of their reflecting surfaces and a pair of mounting means for mounting said light sources for radiating parallel light rays toward the corresponding reflecting surfaces of the reflecting plates and along the reflecting plates' shifting axis.

4,984,881

ROTATION SUPPORTING DEVICE OF A POLYGON MIRROR

Noriyuki Osada, Tokyo; Yasushi Hisabe, Kanagawa; Toshihiro Ohtani, Kanagawa, and Toshiya Kanamori, Kanagawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Dec. 19, 1989, Ser. No. 452,935
Int. Cl.[5] G02B 7/18, 26/10
U.S. Cl. 350—616 12 Claims



1. A rotation supporting device of a polygon mirror, comprising:

a stationary shaft provided with a shaft sleeve around its outer circumference;

a rotary assembly rotatably mounted around the outer circumference of the shaft sleeve and having an outer circumferential surface in the radial direction of a polygon made to serve as mirror surfaces and a magnet member for generating a torque;

an electromagnetic coil assembly disposed in the stationary section oppositely facing the magnet member; and

at least one thrust plate suppressing the axial movement of the rotary assembly,

said rotary assembly having a first rotor rotatably mounted around the outer circumference of the shaft sleeve, a second rotor having an outer circumferential surface of a polygon made to serve as mirror surfaces and secured around the outer circumference of the first rotor, and a yoke being disposed adjacent to one of the ends of the second rotor and secured around the outer circumference of the first rotor, said yoke being adhered with the magnet member.

4,984,882

SCANNER MIRROR CLIP ASSEMBLY

David W. Boyd, Greeley, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 1, 1989, Ser. No. 345,384
Int. Cl.[5] G02B 7/18; A47G 1/24
U.S. Cl. 350—632 12 Claims

1. A scanner mirror assembly comprising:

(a) an elongate optical scanner mirror;

(b) a mirror support structure; and

(c) a clip assembly for attaching said elongate optical scanner mirror to said mirror support structure comprising:

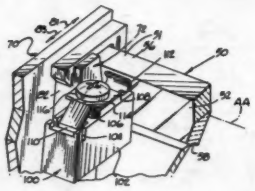
(i) U-shaped body means for resiliently, snappingly engaging said support structure for holding said clip assembly in stationary relationship with said support structure;

(ii) compliant member means integrally formed with said body means for urging said elongate mirror against said support structure whereby said mirror is resiliently held in stationary relationship with said support structure;

(iii) said compliant member means comprising an elongate resilient member having a first end portion attached to

said U-shaped body means and having a second end portion adapted to engage said elongate mirror;

(iv) said U-shaped body means comprising a pair of generally parallel, forwardly extending arm members attached at proximal ends thereof to a transverse member and having inwardly extending projections on distal ends thereof, said inwardly extending projections being adapted to abuttingly engage first predetermine surface portions of said support structure to prevent rearward displacement of said clip assembly, said arm members being adapted to engage second predetermined surface portions of said support structure to prevent vertical displacement of said clip assembly and also being adapted to engage third predetermined portions of said



support structure to prevent lateral displacement of said clip assembly;

(v) said arm members being generally parallel in an unstressed state and being adapted to initially resiliently outwardly deflect and then elastically return to said generally parallel relationship during installation of said clip assembly on said support structure; and

(v) each of said arm end projections comprising:

a forward beveled surface adapted to produce initial outward deflection of an associated arm member during installation of said clip assembly on said support structure; and

a rear vertical surface adapted to abuttingly engage said support structure after installation of said clip assembly on said support structure.

4,984,883

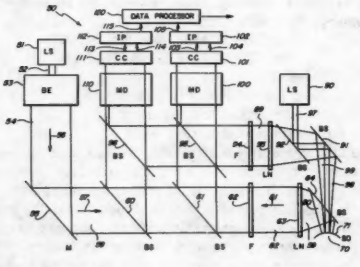
TRANSLATION INSENSITIVE KERATOMETER USING MOIRE DEFLECTOMETRY

Joseph Winocur, 14 San Ramon, Irvine, Calif. 92715

Filed Jul. 21, 1989, Ser. No. 384,159

Int. Cl.[5] A61B *3/107*

U.S. Cl. 351—212 **5 Claims**



1. For use in measuring the curvature and shape of a specular object, a keratometer comprising:

first and second moire deflectometers;

first and second color video cameras directed to said first and second moire deflectometers respectively;

a first source of collimated light having a first wavelength;

a second source of collimated light having a second wavelength;

a beam expander coupled to said first source;

first optical transmission means coupling the output of said beam expander to the specular object such that the incident light thereon is converging and the reflected light therefrom is diverging and such that the light reflected from said specular object is received by said first and second moire deflectometers;

second optical transmission means coupling the output of said second source to said specular object as a collimated light beam which is reflected therefrom as a diverging light beam and coupling the diverging reflected light beam to said first and second moire deflectometers as collimated light.

4,984,884

METHOD FOR MEASURING DISPERSION CHARACTERISTICS OF AN OPTICAL FIBER

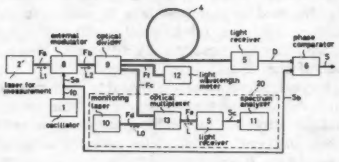
Shiro Ryu, Kanagawa; Kiyohumi Mochizuki, Hachioji, and Yukio Horiuchi, Hiratsuka, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed May 4, 1989, Ser. No. 347,614

Claims priority, application Japan, May 18, 1988, 63-119267

Int. Cl.[5] G01N *21/84, 21/41*

U.S. Cl. 356—73.1 **3 Claims**



1. A method for measuring the dispersion characteristics of an optical fiber, comprising modulating light of a measuring laser with oscillations from an oscillator, to provide an output with a narrow spectral bandwidth, and applying the modulated light to one end of said fiber via an optical divider, whereby said divider divides the modulated signals at a predetermined ratio, the output of the measuring laser being variable in output light wavelength; employing the modulation frequency of the output from said oscillator as a reference electrical signal; converting the measuring light signal transmitted through said fiber to provide a measuring electrical signal; and measuring said characteristics by measuring the phase difference between said reference electrical signal and said measuring electrical signal, multiplexing divided modulated signals with an output light signal from a monitoring laser to generate a beat to measure the oscillation wavelength of said measuring laser by optical heterodyne detection; and comparing the result of the measurement of said oscillation wavelength with that of the measurement of said phase difference.

4,984,885

METHOD AND APPARATUS FOR HIGH POWER OPTICAL FIBER INJECTION AND ALIGNMENT

Angel L. Ortiz, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 15, 1989, Ser. No. 451,061

Int. Cl.[5] G01B *11/27;* **G01J** *1/20*

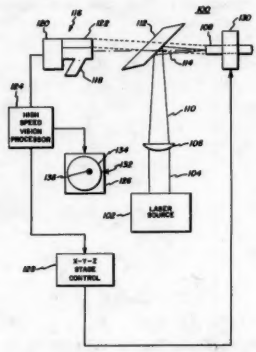
U.S. Cl. 356—153 **19 Claims**

1. An apparatus for controlling injection of a high power beam into an optical fiber, said apparatus comprising:

means for generating, during a materials processing opera-

tion, a signal representative of a focus spot on an injection end of the optical fiber; and

means for adjusting the optical fiber injection end location



dependent upon the representative focus spot signal, said adjusting means providing automated adjustment of the optical fiber injection end during the materials processing operation.

4,984,886

SURFACE INSPECTION APPARATUS FOR OBJECTS

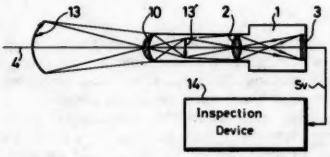
Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,478

Claims priority, application Japan, Jan. 26, 1984, 59-12694

Int. Cl.[5] G01N *21/88*

U.S. Cl. 356—237 **7 Claims**



1. Apparatus for inspecting an object having a non-flat surface comprising: a first optical system having lens means capable of forming a focused spatial image of the non-flat surface of said object in a first flat plane, image receiving means having photo-electric conversion means situated in a second flat plane, said image receiving means having a second optical system having lens means for forming an image, of the spatial image in said first flat plane, in said second flat plane, said photo-electric conversion means providing a signal corresponding to the focused image of the entire non-flat surface of said object in said second place, and inspection means for processing said signal to ascertain whether or not the quality of the non-flat surface of the object is acceptable.

4,984,887

DRIVING METHOD FOR A FLAT PANEL DISPLAY APPARATUS AND THE FLAT PANEL DISPLAY APPARATUS

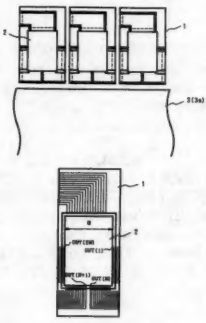
Kazuo Yoshioka, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1989, Ser. No. 301,023

Claims priority, application Japan, Mar. 23, 1988, 63-71453

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—332 **7 Claims**



1. A method for producing a spatial correspondence between a plurality of output signals of a plurality of display driving integrated circuits and a plurality of input signals of a flat panel display apparatus for driving said flat panel display apparatus, wherein a plurality of display data are supplied to each of said plurality of display driving integrated circuits so as to output said plurality of output signals, generated from said display data, from said display driving integrated circuits to the electrodes of said display panel to drive said display panel,

characterized in that said plurality of display data allotted to each of said display driving integrated circuits are divided into preceding and succeeding halves and the display data are supplied to said display driving integrated circuit with the display data within each of said preceding and succeeding halves being reversed in order

4. A flat panel display apparatus with driving integrated circuits, each of which has four sides and has input terminals on one side and output terminals on the other three sides, and

film carriers, having ar least four sides, on which each of said driving integrated circuits is mounted and on which input signal lines connected to input terminals of each of said driving integrated circuit and output signal lines connected to output terminals of each of said driving integrated circuits and to output terminals of said film carriers are patterned;

characterized in that said output terminals of each of said film carriers are all arranged on sides of said film carrier that are approximately perpendicular to the side of said driving integrated circuits on which said input terminals of each said driving integrated circuits are arranged.

4,984,888

TWO-DIMENSIONAL SPECTROMETER

Reginald Tobias, Lancaster, Mass., assignor to IMO Industries, Inc., Princeton, N.J.

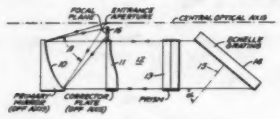
Filed Dec. 13, 1989, Ser. No. 450,027

Int. Cl.[5] G01J *3/28, 3/36*

U.S. Cl. 356—328 **18 Claims**

1. A two-dimensional spectrometer, having a central optical axis for incoming light to be analyzed, a two-dimensional detector array generally transverse to said axis with at least some of its detector elements adjacent to said axis, catadioptric optical means including a mirror system and a refractor/cor-

rector system, each of which systems is a sector of an optical figure of revolution about said central optical axis, said refractor/corrector system producing a collimated beam parallel to but offset from said central optical axis, a two-dimensional



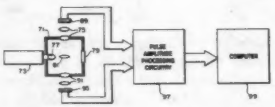
dispersive optical device effectively normal to the collimated beam and producing a reflected cross-dispersed beam back through said refractor/corrector system and said mirror system to said detector array.

4,984,889

PARTICLE SIZE MEASURING SYSTEM WITH COINCIDENCE DETECTION

Holger T. Sommer, Greenbelt, Md., assignor to Pacific Scientific Company, Newport Beach, Calif.

Filed Mar. 10, 1989, Ser. No. 321,409
Int. Cl.[5] G01N *15/14, 21/53*
U.S. Cl. 356—336 5 Claims



1. A particle detection system for detecting particles entrained in a fluid stream comprising a sample cell, means to direct a sample fluid stream entraining particles to be measured through sample cell, means to generate a light beam passing through an entire cross section of said sample stream in said sample cell so that any particle entering in said stream will pass through said light beam, first and second photodetectors, means to direct light scattered in a first direction from any part of said cross section upon said first photodetector, means to direct light scattered in a second direction from any part of said cross section upon said second photodetector, and coincidence means to detect pulses occuring simultaneously in the output signals from said first photodetector and said second photodetector, and means responsive to said coincidence means detecting simultaneous pulses to measure the size of particles causing said simultaneous pulses from the amplitude of at least one of said simultaneous pulses.

4,984,890

METHOD AND AN APPARATUS FOR ALIGNING FIRST AND SECOND OBJECTS WITH EACH OTHER

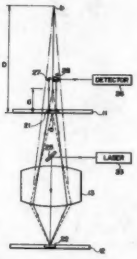
Toru Tojo, Kanagawa; Osamu Kuwabara, Yokohama; Masashi Kamiya, and Hisakazu Yoshino, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 251,842, Sep. 30, 1988, Pat. No. 4,902,133. This application Dec. 20, 1989, Ser. No. 453,856
Claims priority, application Japan, Sep. 30, 1987, 62-246202
Int. Cl.[5] G01B *4/02*
U.S. Cl. 356—356 24 Claims

1. A method for aligning first and second objects with each other, a projection lens disposed between the first and second objects, the first object having one first diffraction point, the second object having two second diffraction points spaced at a predetermined distance, said method comprising the steps of:

directing a light beam emitted from a light source to the first diffraction point so that two diffracted light beams emerge from the first diffraction point;

transferring the two diffracted light beams through the projection lens toward the two second diffraction points, the two diffracted light beams being converged by the projection lens and then being incident on the two second diffraction points, so that two re-diffracted light beams emerge respectively from the two second diffraction points;



detecting the two re-diffracted light beams, thereby obtaining a detection signal which corresponds to a displacement between the first and second objects; and

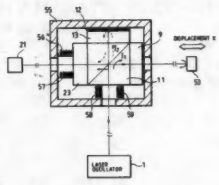
aligning the first and second objects in accordance with the displacement.

4,984,891

LASER GAUGE INTERFEROMETER AND LOCATING METHOD USING THE SAME

Chuuichi Miyazaki, Tsukuba; Toshio Akatsu, Ushiku, and Sadao Mori, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,653
Claims priority, application Japan, Feb. 8, 1988, 63-27025; Jun. 11, 1988, 63-144183
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—358 18 Claims



1. A laser gauge interferometer utilizing interference of laser beams, said laser gauge interferometer apparatus comprising:

means for splitting a laser beam into two laser beams, namely a correcting beam and a measuring beam;

first interferometer means for generating a measurement output representing the quantity of displacement of an object of measurement by use of said measuring beam passing through air independently of said correcting beam;

second interferometer means for generating, independently of said measuring beam, a measurement output affected by the change of refractive index of air, different from the output of said first interferometer means and by use of said correcting beam passing through air in proximity to said measuring beam; and

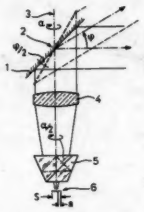
operational means responsive to said measurement outputs, a reference fixed signal representing a reference refractive index of air and a reference signal representative of a starting location for said object, for outputting the result of measurement representing the corrected quantity of displacement of the object of measurement free from the influence of change of the refractive index of air.

4,984,892

APPARATUS FOR THE OPTICAL SCANNING OF A SPHERICAL OR SEMISPHERICAL SPACE

Otto Hofmann, Kirchstockach, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 313,086
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805642
Int. Cl.[5] G01B *11/00*; H01G *3/14*; G02B *26/08*
U.S. Cl. 356—372 7 Claims



1. An apparatus for an optical scanning of at least a portion of a spherical space, comprising:

(a) an objective lens means (4) having an optical axis (3), a row of detector means (6) arranged in an image plane for cooperation with said objective lens means (4),

(b) a rotatable prism (5) located between said objective lens means (4) and said image plane, said rotatable prism (5) being mounted for rotation about said optical axis (3) of said objective lens means,

(c) an optically deflecting element (1 or 7) mounted for rotation about said optical axis (3) in a beam path ahead of said objective lens means (4), whereby said optical axis (3) of said objective lens means (4) forms a primary axis, said optionally deflecting element being also rotatable about a secondary axis (2) arranged at a right angle to said primary axis (3), first drive means (16) for rotating said deflecting element about said primary axis, speed reduction means for transmitting a rotation of said primary axis (3) to said rotatable prism (5) at a speed reduction ratio of about 2:1, wherein

(d) said row of detector means (6) is fixed and coordinated relative to said rotatable prism (5) and relative to said secondary axis (2) of said optically deflecting element (1 or 7) in such a way that an optical axis of individual detector beam bundles deflected by said optically deflecting element (1 or 7) lies in the same plane as said primary axis (3) of said objective lens means (4),

(e) second drive means (9) for rotating said optically deflecting element (1 or 7) about said secondary axis (2),

(f) first measuring means (17) for measuring the rotation (α) of said optically deflecting element (1 or 7) about the primary axis (3), means for controlling in closed loop fashion the revolutions per time unit of said optically deflecting element, depending on a secondary rotation (ϕ), so that said revolution becomes the value

$$U_\alpha = \frac{U_O}{\cos \phi},$$

wherein ϕ is the elevational direction of a measuring beam bundle and U_O is the number of revolutions per time unit for $\phi = 0°$, and

(g) second measuring means (11) for measuring the rotation $\phi/2$ of said optically deflecting element (1 or 7) about the secondary axis (2), and means for controlling the rotational speed of said optically deflecting element in such a way that said rotational speed becomes the value $\phi = U_\alpha \cdot \Delta\phi$, whereby

$$\Delta\phi = \frac{s}{f} = \frac{i \cdot a}{f}$$

represents the angular range of said row of detector means (6) and

s is the length of the row of detector means (6),

f is the focal width of said objective lens means (4),

i is the number of the individual detectors in the row, and

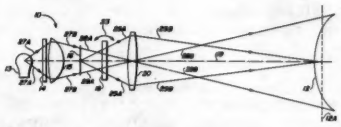
a is the distance between the centers of gravity of the individual detectors.

4,984,893

PHASE SHIFTING DEVICE AND METHOD

Steven R. Lange, Tucson, Ariz., assignor to Wyko Corporation, Tucson, Ariz.

Filed Dec. 1, 1989, Ser. No. 444,542
Int. Cl.[5] G01B *11/24*
U.S. Cl. 356—376 17 Claims



5. A projected fringe contouring non-contact profiler, comprising in combination:

(a) a phase shifting projector including

i. a light source,

ii. a condensing lens receiving light from the light source,

iii. a transparent slide having a grating thereon,

iv. a projecting lens,

v. a flat rotatable transparent plate disposed between the slide and the projecting lens,

vi. a test surface on which the grating is projected,

vii. control means coupled to the transparent plate for rotating it about an axis having a fixed angular relationship to a line of the grating through a plurality of selected angles to modulate the phase of an image of the grating projected on the test surface, the phase shifting projector projecting an image of the grating onto a test surface,

(b) detecting means for receiving the image of the grating projected onto the test surface and producing data representative thereof;

(c) computing means for controlling rotation of the transparent plate;

(d) means for coupling the computing means to the control means to effectuate the modulation of the phase of the projected image of the grating in response to the data produced by the detecting means;

(e) means in the computing means for computing the height of each of a plurality of points on the test surface relative to a reference surface in response to the data produced by the detecting means.

4,984,894

METHOD OF AND APPARATUS FOR MEASURING FILM THICKNESS

Noriyuki Kondo, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

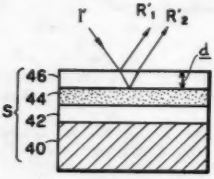
Filed Aug. 16, 1989, Ser. No. 394,650
Claims priority, application Japan, Aug. 17, 1988, 63-203997
Int. Cl.[5] G01B *11/06, 11/02*
U.S. Cl. 356—382 15 Claims

1. A method of determining the thickness of a layer, the method comprising:

providing a sample which includes (1) a substrate, (2) a first layer, the first layer being the uppermost layer of the sample and (3) a second layer, the second layer being located between the first layer and the substrate, the second layer being located directly under the first layer;

irradiating the sample such that a first component of light is reflected by a first surface of the first layer, such that second and third components of the light are transmitted through the first layer, such that the second component is

reflected at an interface between the first layer and the second layer of the sample and such that the third component is absorbed by the second layer;



detecting the spectrum of the reflected components; and using the spectrum to determine the thickness of the first layer.

4,984,895

COLOR COMPARISON DEVICE HAVING A BULGED INSERTION GROOVE FOR HOLDING A TEST STICK IN A FLEXED CONDITION

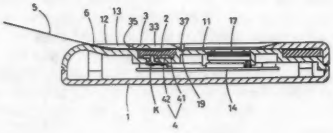
Toshiyuki Kobayashi; Shigeru Makita, both of Kyoto, and Hiroyuki Ota, Osaka, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 13, 1989, Ser. No. 322,427

Claims priority, application Japan, Mar. 14, 1988, 63-34116[U]

Int. Cl.[5] G01J *3/52*

U.S. Cl. 356—423 **1 Claim**



1. A color comparison device comprising:

a casing unit having a comparison window for displaying a comparison color sample section mounted on a rotatable wheel wherein the wheel is rotatably fixed with a protruding display section of the casing unit;

a test stick insertion groove portion formed in an upper surface of said casing unit at one end portion thereof, said insertion groove portion communicating with said comparison window so that a reagent portion of a test stick inserted into said insertion groove portion overlies said comparison color sample section in said comparison window;

means for causing a test stick inserted into said insertion groove to be held in a flexed condition wherein said causing means comprises a bulged fixing section provided at said insertion groove and an inlet portion of said insertion groove portion, a test stick inserted into said insertion groove being held in a flexed condition by said bulged fixing section and said inlet portion of said insertion groove.

4,984,896

METHOD AND APPARATUS FOR OPTICALLY MONITORING A KNITTED ARTICLE

Peter Flämig, Grosskarolinenfeld, Fed. Rep. of Germany, assignor to Protechna Herbst GmbH & Co. K.G., Ottobrunn, Fed. Rep. of Germany

Filed Oct. 5, 1988, Ser. No. 253,713

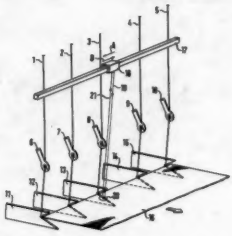
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1987, 3733791

Int. Cl.[5] G01N *21/84, 21/86;* **D04B** *35/12*

U.S. Cl. 356—429 **20 Claims**

1. Method for optically monitoring a knitted article for faults during the manufacture thereof in a knitwear processing machine, said knitwear processing machine including an optical scanner for scanning the width of the knitted article perpendicularly to the direction of take-off and, on detection of a fault in the knitted article, indicates such a fault and/or stops the knitwear processing machine, comprising:

scanning the knitted article line by line with the optical scanner and delivering scan signals generated by the optical scanner during such scanning to a digital processing circuit;



storing the scan signals in the digital processing circuit as pattern signals while in a reference mode; and

in a subsequent operating mode during manufacture of a knitted article, scanning the knitted article line by line and comparing the scan signals generated by the optical scanner during the operating mode with the pattern signals which correspond in scan position thereto, thereby determining whether the scan signals generated during the operating mode match the corresponding pattern signals.

4,984,897

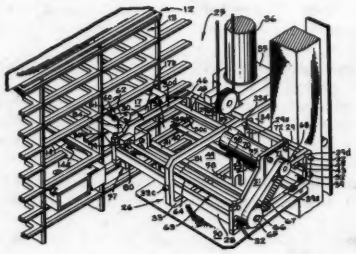
CARRIAGE MECHANISM FOR AUTOMATIC EXTRACTING AND INSERTING OF CASSETTES

Antoni S. Baranski, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 227,412, Jul. 29, 1988, abandoned, which is a continuation of Ser. No. 851,047, Apr. 11, 1986, abandoned. This application Aug. 25, 1989, Ser. No. 399,401

Int. Cl.[5] G11B *15/68*

U.S. Cl. 360—92 **21 Claims**



1. In a bin structure having discrete bin locations for storing individual cassettes, a carriage mechanism displaced from the bin structure for linear transport of a cassette with respect to the bin structure comprising:

a cassette envelope for receiving a cassette, said envelope defined by a plurality of support rails for supporting the cassette in the envelope, said rails movable relative to each other to bias the cassette to an optimum holding position within the envelope, said holding position defined by orthogonal coordinates along respective coordinate axes with at least one first moveable support rail and at least one second movable support rail operative to bias the cassette along respective first and second coordinate axes

of the envelope toward the optimum holding position for the cassette within the envelope, thereby to minimize movement of the cassette during transport by the carriage mechanism, as well as to minimize mis-insertion of the cassette into and out of the envelope;

an extracting mechanism for extracting the cassette from a first bin location and out of the bin structure and drawing it into the envelope; and

positioning apparatus for positioning the cassette with respect to a third axis of the envelope, and at the optimum holding position for the cassette within the envelope, and the cassette extracting mechanism cooperating with the support rails and the positioning apparatus to assure delivery of the cassette to the optimum holding position within the cassette receiving envelope, such position stabilizing the carriage mechanism for movement in the loaded position and preventing obstructive engagement of the cassette with the bin structure as the carriage mechanism moves the cassette from one bin location to another in the bin structure.

4,984,898

LASER INTERFEROMETER FOR INTERFEROMETRIC LENGTH MEASUREMENTS INCLUDING AN AUTOMATIC-COMPENSATING CIRCUIT

Heinrich Höfler, Teningen, and Eckhard Bergmann, Freiburg, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V., Munich, Fed. Rep. of Germany

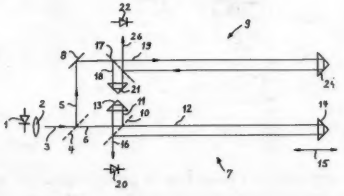
PCT No. PCT/DE88/00069, § 371 Date Sep. 29, 1988, § 102(e) Date Sep. 29, 1988, PCT Pub. No. WO88/06711, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 12, 1988, Ser. No. 274,810

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706347

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—358 **6 Claims**



1. A laser interferometer for interferometric length measurement including a semiconductor laser for emitting a light beam which energizes, by way of a beam divider, a measuring interferometer for generating a measuring interference light beam, said measuring interferometer having two reflectors and a measuring section, one of said reflectors being operatively associated with a moveable object to be measured, said laser energizing a reference interferometer for generating a reference interference light beam, said reference interferometer serving to control the wavelength of said laser light beam, said reference interferometer comprising a reference section including a fixed reference reflector, said reference interference light beam adapted to energize a reference signal detector, said reference signal detector generating a reference output signal, said reference output signal being fed to a closed loop feedback control circuit, said control circuit adapted to monitor the maximum, minimum, and slope values of said reference signal detector output signal for automatically and continuously adjusting both the supply current and operating temperature of said semiconductor laser during measurment operations while said reference reflector is fixed to thereby adjust the frequency of said laser in order to maintain said reference output signal constant, the interference light beam of the measuring interferometer containing information indicative of a length to be measured and adapted to impinge on an interference signal detector, said interference signal detector generating a measurement output signal which is fed to an evaluating device for determining the length to be measured, said reference section extending parallel to said measurement section a longitudinal distance substantially equal to the length of said measuring section, the lateral distance between said reference and measuring sections being very small relative to the length of said measuring section, said fixed reference reflector being adjustable in the longitudinal direction of said reference section whereby said reference section may be adapted to the length of said measuring section between measuring operations.

4,984,899

AGITATOR VESSEL WITH RADIALLY CONVEYING AGITATOR AND WITH AT LEAST ONE BAFFLE, AS WELL AS PROCESS FOR THE THOROUGH MIXING OF LIQUIDS WITH THE AID OF THIS AGITATOR VESSEL

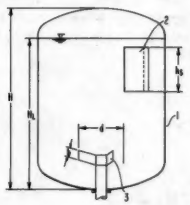
Franz-Michael Bollenrath, Marl, and Josef K. Rigler, Dülmen, both of Fed. Rep. of Germany, assignors to Huls AG, Marl, Fed. Rep. of Germany

Filed Jun. 21, 1989, Ser. No. 369,602

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1988, 3821033

Int. Cl.[5] B01F *7/04*

U.S. Cl. 366—302 **10 Claims**



1. An agitator vessel comprising a vessel with a diameter D equipped with at least one adjustable baffle and a radially conveying agitator mounted at a spacing of maximally D/2 from the bottom of the agitator vessel, characterized in that the at least one baffle

(1) is located in the top half of the agitator vessel;

(2) is mounted at a spacing R_1 from the agitator vessel wall wherein the relationship applies

$$D/10\ R_1\ D/3$$

(3) has a height h_s, and

(4) exhibits or exhibit the shape of an airfoil profile, i.e. it is curved in the form of an Archimedean spiral or in the form of part of a circular arc.

4,984,900

MIXER PARTICULARLY FOR FIBROUS PRODUCTS

Tiziano Faccia, Via Padova 102, 35026 Conselve (Provincia di Padova), Italy

Filed Jul. 10, 1989, Ser. No. 377,667

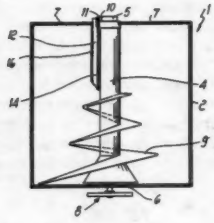
Claims priority, application Italy, Jul. 11, 1988, 41637 A/88

Int. Cl.[5] B01F *7/24*

U.S. Cl. 366—305 **6 Claims**

1. Improvements in a mixer particularly for fibrous products, comprising a mixing container internally provided with at least one vertical screw welded to a shaft which rotates about end pins fixed to said container, said mixer furthermore comprising at least one scraping element fixed to at least one of said pins and extending longitudinally adjacent to said shaft, said at least

one scraping element having at least one blade associated therewith, extending substantially parallel to the surface of said



shaft to scrape the surface of said shaft and at least one further blade which is spaced from said surface, extending in a direction substantially perpendicular to that of said blade.

4,984,901

MAGNETIC RECORDING DISC HAVING SECTOR REFERENCE ZONE, DEVICE FOR READING SAME, AND MAGNETOOPTICAL MEMORY OPTOELECTRONIC EMPLOYING SAID DEVICE

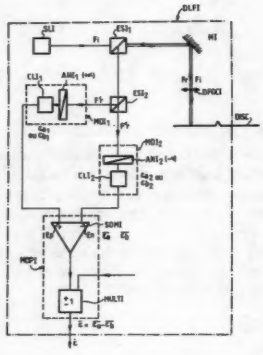
Christian Maury, Voisins le Bx, France, assignor to Bull S.A., Paris, France

Filed May 25, 1988, Ser. No. 198,221

Claims priority, application France, May 27, 1987, 87 07514

Int. Cl.[5] G11B *7/095, 7/013*

U.S. Cl. 369—44.26 **6 Claims**



1. A magnetic recording disc having opposed surfaces, at least one of said surfaces having a magnetic recording layer, said disc being adapted to move in a rotating manner relative to a magnetic transducer positioned for recording data on said layer, a plurality of concentric annular tracks being defined on said layer, each track being divided into a plurality of sectors, each of said sectors having associated therewith a reference zone containing identification data for said sector, said reference zone being preceded by a blank zone having a uniform magnetization and separated from said reference zone by a special magnetic transition allowing detection of the beginning of the zone, and said reference zone (ZRP_{ij}) comprising successively from the special magnetic transition:

a first group of preamble information ($ZSY_{ij}+ZCA_{ij}$),

a second group of absolute address information (ZAD_{ij}),

a third group of fine-position information (GDP_{ij}),

said first and second groups being disposed and centered on a track of serial number j, while said third group is offset with respect to a center said track of serial number j, such that a boundary between said third group of said reference zone and an adjacent third group of an adjacent reference zone coincides with said center of the track of serial number j, wherein said third group comprises consecutively a first and a second magnetic domain (AP_{ij}, BP_{ij}), each having a uniform magnetization opposite one another, and wherein corresponding magnetic domains (AP_{ij}, $AP_{K(j+1)}$), of said third group and an adjacent third group of said sector are of opposite magnetization.

4,984,902

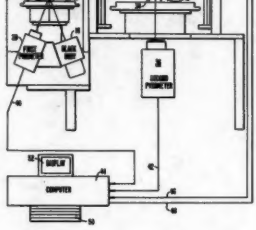
APPARATUS AND METHOD FOR COMPENSATING FOR ERRORS IN TEMPERATURE MEASUREMENT OF SEMICONDUCTOR WAFERS DURING RAPID THERMAL PROCESSING

John L. Crowley; Ahmad Kermani, both of Fremont; Stephan E. Lassig, Milpitas; Noel H. Johnson, San Jose, and Gary R. Rickords, Fremont, all of Calif., assignors to Peak Systems, Inc., Fremont, Calif.

Division of Ser. No. 337,628, Apr. 13, 1989. This application Apr. 17, 1990, Ser. No. 510,357

Int. Cl.[5] G01R *15/00*

U.S. Cl. 374—1 **7 Claims**



1. An apparatus for calibrating a processing signal derived from characteristics of a semiconductor wafer, comprising:

a processing chamber having a range of temperature settings including means for holding a calibration wafer;

temperature measurement means coupled to the processing chamber for transmitting a signal indicating a temperature of said calibration wafer at a particular temperature setting;

light emission masurement means coupled to said processing chamber for measuring an amount of light emitted by said calibration wafer at said particular temperature setting; and

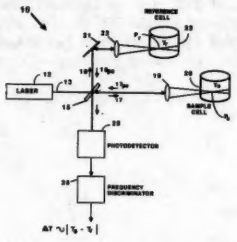
computer means for recording the amount of light emitted and temperature of said calibration wafer connected to the temperature measurement and light emission measurement means, including memory means for storing a first calibration table constructed from the measured light emission and temperature values used to determine a level of the processing signal, the computer means being programmed to recall and modify entries of the first calibration table according to light emission values of a sample batch wafer as measured by the light emission measurement means to generate a second calibration table and further programmed to calibrate said processing signal based on said entries of said second calibration table.

4,984,903

METHOD OF OPTICALLY AND REMOTELY SENSING SUBSURFACE WATER TEMPERATURE

Harold E. Sweeney, Menlo Park, Calif., assignor to GTE Government Systems Corporation, Stamford, Conn.

Filed Aug. 1, 1989, Ser. No. 387,734
Int. Cl.[5] G01K *5/00, 13/00;* G01J *5/48*
U.S. Cl. 374—123 2 Claims



1. A method of remotely measuring an unknown temperature T_s of a transparent medium by comparison with a known temperature T_r of a transparent reference material, consisting of the steps of:

simultaneously directing into said transparent medium and into said transparent reference material a pulsed laser output beam comprising a plurality of pulses each having an intensity sufficient to cause stimulated Brillouin scattering (SBS) in said medium and in said material and thereby causing pulsed phase-conjugate (PC) beams to emanate from said medium and said material, respectively, said PC beams having frequencies proportional to the temperatures of said medium and said material, respectively;

mixing said PC beams and thereby producing a difference frequency proportional to the difference in temperatures T_s and T_r; and

converting said difference frequency to the temperature T_s.

4,984,904

APPARATUS FOR CONTINUOUSLY MEASURING TEMPERATURE OF MOLTEN METAL AND METHOD FOR MAKING SAME

Masao Nakano, Higashi-Sumiyoshi; Keiichi Mori, Hyogo; Yoshitaka Hiraiwa, Fukuoka; Shoji Iizuka, Kita-Kyushu; Shozo Shima, and Yukio Nakamura, both of Chiba, all of Japan, assignors to Kawaso Electric Industrial Co., Ltd., Osaka; Kurosaki Refractories Co., Ltd., Kita-Kyushu and Nippon Steel Corporation, Tokyo, all of, Japan

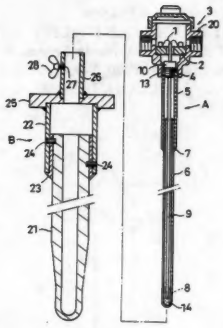
Filed Apr. 11, 1989, Ser. No. 336,333
Int. Cl.[5] G01K *1/08, 7/02*
U.S. Cl. 374—139 9 Claims

1. An apparatus for continuously measuring the temperature of molten metal comprising a thermocouple unit and an immersion protection tube unit, wherein:

said thermocouple unit comprises a thermocouple temperature sensing element comprising a platinum-platinum/-rhodium alloy thermocouple and terminals connected therewith, an insulator containing said thermocouple, a porcelain protection tube into which said insulator is inserted, and a terminal box having an extension sleeve with which the upper part of said porcelain protection tube is held and having a housing which contains said terminals;

said immersion protection tube unit comprises an alumina-graphite protection tube having an SiO_2 component of less than 8 wt %, a holding sleeve into which the upper part of said alumina-graphite protection tube is fixedly inserted, and a connecting sleeve connected with said holding sleeve;

said porcelain protection tube of said thermocouple unit is detachably inserted into said alumina-graphite protection tube of said immersion protection tube unit with said extension sleeve of said thermocouple unit being detachably inserted into said connecting sleeve of said immersion protection tube unit; and



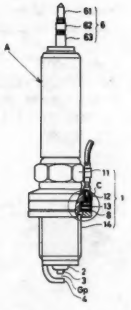
a fixing means detachably fixes said extension sleeve and said connecting sleeve with each other to allow easy removal of said thermocouple unit from said immersion protection tube unit.

4,984,905

TEMPERATURE AND PRESSURE DETECTING TYPE SPARK PLUG

Kozo Amano, and Yoshihiro Matsubara, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Mar. 16, 1990, Ser. No. 494,339
Claims priority, application Japan, Apr. 3, 1989, 1-39502[U]
Int. Cl.[5] G01K *1/14, 1/26*
U.S. Cl. 374—143 8 Claims



1. A temperature and pressure detecting type spark plug comprising;

a cylindrical metallic shell having a mounting seat around an outer surface of the shell so as to secure the shell to a cylinder head of an internal combustion engine;

an insulator concentrically disposed in the metallic shell, and having an axial bore in lengthwise direction;

a center electrode concentrically disposed in the axial bore of the insulator so as to form a discharge gap with an outer electrode which is depended from the metallic shell; a hollow portion axially provided with, at least, a front end of the center electrode to enclose a thermocouple which form a thermosensor to detect a temperature of the front end of the center electrode; and

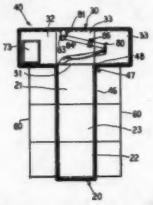
an annular pressure sensor placed at the mounting seat of the metallic shell to detect a pressure within a combustion chamber in the cylinder head, the pressure sensor being sandwiched between the mounting seat and the cylinder head when the spark plug is secured to the cylinder head.

4,984,906

MULTI-PURPOSE UTILITY TOTE

Vicki A. Little, P.O. Box 781, Santa Teresa, N. Mex. 88008

Filed Mar. 29, 1990, Ser. No. 500,931
Int. Cl.[5] B65D *30/00*
U.S. Cl. 383—4 **21 Claims**



1. A multi-purpose utility tote comprising:

a T-shaped unit having a perimeter;

a zipper chain extending about said perimeter of said T-shaped unit, said zipper chain having a starting point at an internal corner of said T-shaped unit and extending continuously about said perimeter of said T-shaped unit to ultimately terminate at said internal corner; p1 a slide fastener having a starting point at said internal corner of said T-shaped unit,

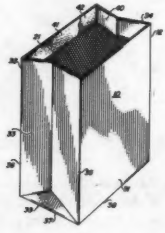
said T-shaped unit being convertible into a parallelepiped container by pulling said slide fastener from said starting point at said internal corner of said T-shaped unit to an end point at a further internal corner of said T-shaped unit, pulling of said slide fastener causing engagement of said zipper chain thereby folding said T-shaped unit to form side panels of said parallelepiped container.

4,984,907

GREASE ABSORBENT DEVICE

Brenda Power, 2452 E. Evergreen, Mesa, Ariz. 85203

Filed Aug. 7, 1989, Ser. No. 390,535
Int. Cl.[5] B65D *30/02*
U.S. Cl. 383—109 **15 Claims**



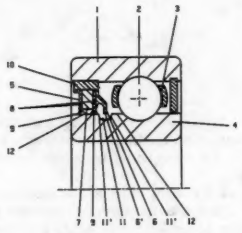
1. A device for absorbing grease from fried and grilled food stuffs placed therein without detracting from the appearance or the wholesomeness thereof, said device comprising an exterior body portion having an inner and an outer surface; a grease absorbent non-toxic liner disposed in surface-to-surface engagement on said inner surface of said body portion; and a foraminous netting formed of heat resistant weavable nonmetallic material over laying said absorbent liner and coacting with said body portion to create a sandwich therewith, said foramious netting preventing the engagement of said food stuff with said liner while permitting the passage of grease from said food stuff into said absorbent liner.

4,984,908

PRE-SEAL FOR MAGNETIC LIQUID SEAL FOR AN ANTI-FRICTION BEARING

Alban Kronenberger, Schweinfurt, and Oswald Bayer, Aidhausen, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Apr. 5, 1990, Ser. No. 505,054
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1989, 8904503[U]
Int. Cl.[5] F16C *33/82*
U.S. Cl. 384—478 **10 Claims**



1. A magnetic liquid seal assembly for an anti-friction bearing, wherein

the bearing comprises an inner race element, an outer race element radially spaced from and around the inner race element and a row of rolling elements between the inner race element and the outer race element;

a magnetic liquid seal at one axial side of the rolling elements between the inner race element and the outer race element for sealing the space between the inner race element and the outer race element, the magnetic liquid seal comprising an annular magnet in the space;

at least one pole ring next to the magnet, the pole ring extending radially toward but being out of contact with one of the inner race element and the outer race element, a magnetizable liquid disposed between the pole ring and the race element toward which the pole ring radially extends;

a pre-seal supported at the magnet and at the pole ring on the axial side of the magnetic liquid seal that is toward the rolling elements, the pre-seal including a lip extending toward the one of the inner race element and the outer race element;

the magnetic liquid seal being integrated with the pre-seal as a unit;

a notch defined in the surface of the one of the inner race element and the outer race element and positioned with respect to the pre-seal lip such that the pre-seal lip extends toward the notch without contacting in the notch.

4,984,909

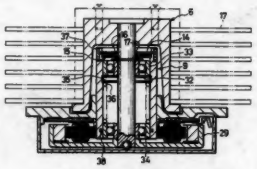
BEARING DEVICE

Yozo Shirotori, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Continuation of Ser. No. 111,232, Oct. 22, 1987, Pat. No. 4,907,897. This application Sep. 11, 1989, Ser. No. 405,820
Claims priority, application Japan, Oct. 22, 1986, 61-249512
The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.
Int. Cl.[5] F16C *19/08*
U.S. Cl. 384—493 **12 Claims**

1. A bearing device for use in a computer disk drive compris-

ing a shaft, bearings supporting said shaft, and a bearing holder adapted to hold said bearings, said shaft, said bearings, and said bearing holder being made of materials which have substantially equal thermal expansion coefficients to minimize device deforming mechanical forces due to thermal expansion differ-



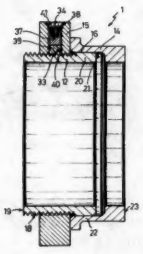
entials between any of said shaft, bearings and bearing holder, thereby to minimize disk reading and/or writing errors introduced by said forces on an operation of said computer disk drive, and further comprising a hub and rotor magnets which are rotated together with said shaft, and a stator confronting said rotor magnets, said hub supporting magnetic disks.

4,984,910

ADJUSTABLE SPACER, PARTICULARLY FOR ROLLING BEARINGS, AND SUPPORT ASSEMBLY IMPLEMENTING THE SAME

Pietro Cogno, Torino, Italy, assignor to RIV-SKF Officine Di Villar Perosa S.p.A., Italy

Filed Sep. 14, 1989, Ser. No. 407,124
Claims priority, application Italy, Sep. 16, 1988, 67828 A/88
Int. Cl.[5] F16C *23/06*
U.S. Cl. 384—563 **9 Claims**



1. An adjustable spacer, for ensuring correct axial positioning of pairs of side-by-side rolling bearings on a support assembly comprising;

a first and second annular element mounted coaxially with each other, said first annular element having a first end, the first end being engaged partially and in sliding manner inside a corresponding opposite first end on second annular element;

a third element supported radially and in an axially mobile manner on the outside of said first annular element, and designed to act as an axial shoulder for said second annular element; and

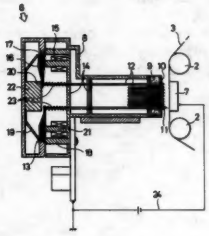
locking means for selectively securing said third element in a number of predeteremined axial positions on and angularly integral with said first annular element.

4,984,911

INK DOT PRINTER

Tetsuro Nakayama, Shizuoka, Japan, assignor to Tokyo Electric Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 829,515, Feb. 14, 1986, abandoned. This application Feb. 26, 1988, Ser. No. 163,201
Claims priority, application Japan, Feb. 28, 1985, 60-39605
Int. Cl.[5] B41J *3/12*; G01D *15/16*
U.S. Cl. 400—124 **6 Claims**



1. An ink dot printer comprising a print head including a plurality of printing elements having ends to which ink is adhered, and an opposing electrode disposed in an opposing relationship to the ends of said printing elements with record paper interposed therebetween, whereby a negative voltage is applied to said opposing electrode while said print head is grounded to provide between said opposing electrode and said printing elements a potential difference sufficient to cause the ink to fly toward said opposing electrode.

4,984,912

MULTICOLORED FABRIC PRINTING RIBBON INCLUDING NONBLEEDING, NONMIGRATING FLUSHED PIGMENT

Hugh T. Findlay, Lexington; Kenneth H. Froman, Versailles, and James F. Martone, Lexington, all of Ky., assignors to Internal Business Machine Corporation, Armonk, N.Y.

Continuation of Ser. No. 229,194, Aug. 8, 1988. This application Apr. 19, 1990, Ser. No. 512,630
Int. Cl.[5] B41J *31/00*
U.S. Cl. 400—240.2 **1 Claim**

1. A woven fabric impact ribbon comprising adjoining areas having a flowable ink of different colors in said areas each of said ink including a coloring matter and a liquid carrier said fabric ribbon having no change of weave and no physical color-separating barriers anywhere in the ribbon including at the adjoining areas between the different colors, the coloring matter of each of said areas not bleeding in normal use into another of said areas, and the coloring matter of each of said flowable inks consisting essentially of flushed pigments having an average particle size of between $\frac{1}{4}$ and 1 micron and no more than 2 microns.

4,984,913

PRINTER HAVING RIBBON WEAR INDICATOR

Stanley Silverman, Westminster; Kenneth A. Konechy, Santa Ana; Ray G. Van De Walker, Tustin, and Richard S. Newman, Costa Mesa, all of Calif., assignors to Printronix, Inc., Irvine, Calif.

Filed Jul. 11, 1988, Ser. No. 217,459
Int. Cl.[5] B41J *35/36*
U.S. Cl. 400—249 **16 Claims**

12. In an impact printer system having an ink ribbon which is gradually worn as printing occurs, an arrangement for indicating when the expected life of the ribbon is ended comprising:

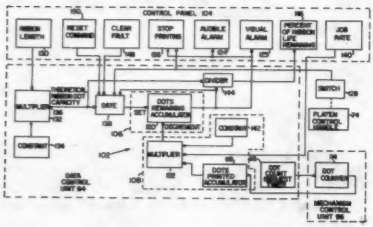
means for providing a count representing maximum theoreti-

cal printer system impact action possible for the ink ribbon;

an accumulator having a set input coupled to be initially set by the count representing maximum theoretical printer system impact action possible, and a decrement input coupled to decrement the count initially set therein in response to impact action undergone by the printer system, the decremented count within the accumulator being provided at an output thereof; and

means coupled to the output of the accumulator for providing an indication that the ink ribbon is worn when the count in the accumulator has been decremented substantially to zero;

the means for providing a count representing maximum theoretical printer system impact action possible for the ink ribbon including means for providing an indication of



ribbon length, means for providing a first constant, and a first multiplier for multiplying the indication of ribbon length by the constant to provide the count representing maximum theoretical printer system impact action possible for the ink ribbon;

means for providing an indication of job rate for printing to be done by the printer system;

means for providing a second constant;

a second multiplier; and

a second accumulator coupled to the decrement input of the first mentioned accumulator through the second multiplier and having an input coupled to receive counts of impact action undergone by the printer system, the second multiplier multiplying counts in the second accumulator by the indication of job rate and the second constant and providing the product thereof to the decrement input of the first mentioned accumulator.

4,984,914

MULTI-TASK PRINTER

Tpshio Hayakawa, 3717 Cardiff, No. 101, Los Angeles, Calif. 90034

Continuation-in-part of Ser. No. 174,140, Mar. 28, 1988, abandoned. This application Jul. 10, 1989, Ser. No. 377,174

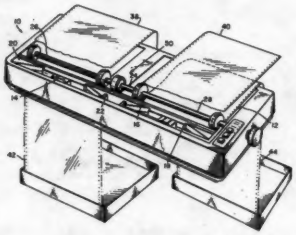
Int. Cl.[5] B41J *11/50, 15/18*

U.S. Cl. 400—585 **2 Claims**

1. A printing device operable by a computer and comprising:

a housing formed with an opening extending therethrough, a printer shaft fixedly held, but allowed to rotate extending transversely across said opening, a print head mounted on said printer shaft and movable along said shaft under the control of said computer, a permanent stop located adjacent to a left end of said printer shaft to limit leftward movement of said print head, said print head being displaceable against a selected one of said stops by means of either computer control or manual displacement thereof; and

a longitudinally stationary feeding device for selectively feeding a pair of form strips to said print head and having a drive shaft extending transversely across said opening adjacent to said print head, a motor for rotating said drive shaft under the control of said computer, two platens restricted to rotational movement on said drive shaft each provided with respective pairs of drive sprockets restricted to rotational movement, and clutch means for selectively connecting said drive shaft to rotate a desired one of said platens, said clutch means being selectively



operable responsive to (1) a control signal from said computer and (2) a manual displacement of a handle member of said clutch means, and wherein said drive sprockets pull said form strips around said platens.

4,984,915

WEB HOLDING DEVICE

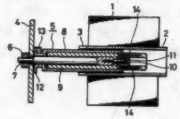
Takeshi Tashiro, Shizuoka, and Ikuzo Sugiura, Kanagawa, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

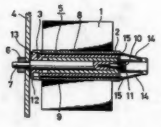
Filed Aug. 21, 1989, Ser. No. 396,125

Claims priority, application Japan, Aug. 23, 1988, 63-110249; Jun. 28, 1989, 1-165570

Int. Cl.[5] B41J *15/02, 15/04*

U.S. Cl. 400—613 **10 Claims**





1. A web holding device for a web wound on a core having an engaging section at one end thereof, comprising:

a frame and a driving unit;

a web driving shaft coupled with said driving unit and rotatably supported at one end on said frame;

an engaging projection section formed at said one end of said web driving shaft closes to the frame, for engagement with the engaging section of the core when the core is mounted on said web driving shaft with the engaging section facing the frame; and

a plurality of tapered elastic pieces, each of said tapered elastic pieces having one end connected to another end of said web driving shaft, each of said tapered elastic pieces having another end, and projecting from said one end thereof to said another end thereof in a direction radially outward and toward said one end of said web driving shaft,

whereby said another ends of said tapered elastic pieces comprise contact portions which contact an end of the

core opposite the engaging section when the core is mounted on said web driving shaft.

4,984,916

RECORDING APPARATUS HAVING A PLATEN ROTATABLE BETWEEN POSITIONS IN WHICH THE PLATEN FACES AND IS SEPARATED FROM A RECORDING HEAD

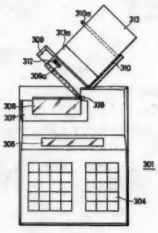
Kazumi Sekine, Kawasaki, and Kaname Suwa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 6,443, Jan. 23, 1987, abandoned. This application Jan. 24, 1989, Ser. No. 300,716

Claims priority, application Japan, Jan. 27, 1986, 61-13848; Jan. 27, 1986, 61-13849; Feb. 5, 1986, 61-22058; Feb. 5, 1986, 61-22059; Feb. 7, 1986, 61-23855

Int. Cl.[5] B41J *15/02*

U.S. Cl. 400—613.1 **4 Claims**



1. A recording apparatus comprising:

means for performing a recording operation on paper drawn from a roll paper source on a recording surface thereof;

guide means having a first guide surface for guiding the drawn paper from the roll paper source to said recording means;

platen means having a second guide surface facing said first guide surface and a paper supporting surface facing said recording surface of said recording means;

holding means for holding said platen means to be movable between a first position at which said first and second guide surfaces face each other and a second position at which said first and second guide surfaces are separated from each other, said holding means holding said platen means, in the form of a cantilever, through a rotation shaft disposed at a position near an edge along a widthwise direction of the paper, the axis of said shaft being oriented in a direction perpendicular to the widthwise direction of the paper;

paper holding means, integrally fixed to said platen means, for holding the roll paper source, said paper holding means being positioned at the rear of a body of said apparatus and projecting from the exterior thereof, the paper holding means being rotated about said shaft together with said platen means as one body;

an insertion port through which an end of the paper can be inserted; and

setting means for supplying to said recording surface the paper inserted into said insertion port;

wherein when said platen means is moved to the second position separated from said recording surface, the paper can be supplied to said recording surface from a side of an open end of said platen means opposite from a side where said platen means is supported by said holding means, and wherein when said platen means is in the first position an end of the paper can be inserted into said insertion port to enable said setting means to supply the paper to said recording surface.

4,984,917

LAMINATED PLATEN BAR FOR NOISE ATTENUATION IN MATRIX PRINTERS

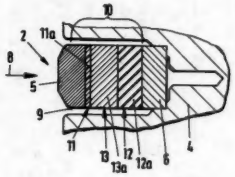
Wolfgang Hauslaib, Langenau, and Guenter Gomoll, Nersingen/Leibi, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 31, 1986, Ser. No. 926,351

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3538762

Int. Cl.[5] B41J *11/08, 11/053*

U.S. Cl. 400—656 **6 Claims**



1. Printer, particularly matrix printer, wherein the print element, needles or styli, are mounted on and being part of a print head moving along a platen, the platen being mounted in a printer frame, the improvement comprising:

said platen being of laminated construction with the layers extending parallel to a longitudinal extension of the platen and transversely to operating directions of the print elements, and including a metallic platen bar, a metallic platen support there being a platen carrier to which said platen support is connected, the platen support, the platen carrier and the frame constituting a relatively large mass, large in comparison with the platen bar; and

a first layer provided for attenuating oscillations and serving as an attenuating layer and being interposed between said platen bar and said support, and a further vibratory, decoupling layer being interposed between said support at said attenuating layer, decoupling being with regard to said oscillations as resulting from impacts of the print elements upon the platen.

4,984,918

MAKEUP LIQUID CONTAINER WITH APPLICATOR

Shigeo Iizuka; Hiroyuki Nakamura; Takao Kishi, and Syuzo Endo, all of Koto, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,843

Claims priority, application Japan, Jan. 29, 1988, 63-10721; Jan. 29, 1988, 63-10722; Feb. 1, 1988, 63-12410; Feb. 3, 1988, 63-13376; Sep. 1, 1988, 63-115206

Int. Cl.[5] A46B *11/00*

U.S. Cl. 401—4 **32 Claims**

1. A makeup liquid container with an applicator comprising:

a container body having a barrel portion and an open neck portion;

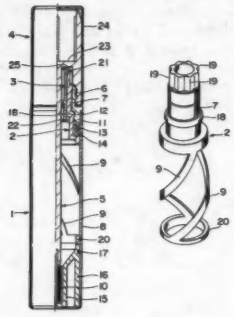
a cap selectively threadably connected to the open neck portion of the container body, said cap engaging with said open neck portion upon rotation in a first screwing direction and disengaging from said open neck portion upon rotation in a second unscrewing direction opposite to said first direction;

a squeezing sleeve fitted in said open neck portion of said container body;

an applicator shaft extended downward from the cap into said container body through said squeezing sleeve;

a stirrer disposed rotatably about the longitudinal axis of said barrel portion and in continuous sliding contact with the inner surface of said barrel portion so as to scrape makeup liquid from a portion of said inner surface, said portion of

said inner surface including at least two points separated from each other in at least said longitudinal direction; and engaging means for providing a driving connection between said cap and said stirrer in such a manner that said stirrer



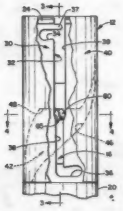
is rotated when said cap is rotated in the screwing and unscrewing directions and that the driving connection between said cap and said stirrer is disengaged when said applicator shaft is extracted from said container body.

4,984,919

LIPSTICK-TYPE COSMETIC CASE

George W. Hultgren, Fairfield, Conn., assignor to Lake Eyelet Manufacturing Company, Incorporated, Southington, Conn.

Filed Oct. 13, 1989, Ser. No. 421,265
Int. Cl.[5] A45D *40/06, 40/12*
U.S. Cl. 401—78 10 Claims



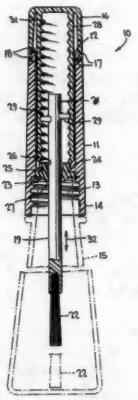
1. In a cosmetic applicator having inner and outer, generally cylindrical, relatively rotatable, coaxial sleeves with cooperating cam tracks and a carrier with a cosmetic support mounted within the sleeves and cam follower means received within the cooperating can tracks for reciprocating the carrier inwardly and outwardly between an inner fully retracted position and an outer fully extended position by relative rotation of the sleeves in opposite directions, the cooperating cam tracks comprising at least one pair of cooperating, generally axial and helical cam tracks for positioning the carrier in a predetermined stable intermediate position thereof, the improvement wherein each said pair of cam tracks comprises first and second contiguous pairs of cooperating sections of said axial and helical cam tracks, the first pair of cooperating sections freely receiving the cam follower means for unrestricted movement therealong and comprising a first unrestricted section of said axial cam track and a first unrestricted section of said helical cam track, each having a substantially constant width along the full length thereof, the second pair of cooperating sections comprising a second restricted section of said axial cam track slightly narrower than the cam follower means for restricted movement of the cam follower means therealong and a second unrestricted section of said helical cam track having a substantially constant width along the full length thereof which is substantially greater than the width of said first section of said helical cam track, said first and second helical cam track sections together providing, along the full length of one edge thereof, one continuous, helically extending cam edge and, along the full length of the opposite edge thereof, a pair of circumferentially stepped, continuous, helically extending cam edge section s and a circumferentially extending locking edge section therebetween having a circumferentially length greater than the width of the cam follower means, the locking edge section facing in one axial direction toward said second restricted section of said axial cam track and axially located to cooperate to retain the cam follower means therebetween to retain the carrier in a corresponding stable intermediate position.

4,984,920

CLOSURE ASSEMBLY HAVING AN AXIALLY MOVABLE LIQUID DISPENSER

R. Kevin O'Neill, Wrightwood, Calif., assignor to Calmar, Inc., Watchung, N.J.

Filed Jul. 19, 1989, Ser. No. 381,977
Int. Cl.[5] A46B *11/00*
U.S. Cl. 401—127 6 Claims



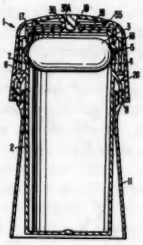
1. A closure assembly having an axially movable liquid dispenser, comprising a hollow sleeve open at one end and having container mounting means at an opposite end, a liquid dispenser adjuster cap mounted without axial movement on said one end for rotation about a central axis of said sleeve, said liquid dispenser comprising a stem mounted for axial movement inwardly and outwardly of said sleeve, means on said sleeve in engagement with said stem to prevent stem rotation upon said axial movement, cooperating means on said cap and on said stem for effecting said axial movement upon rotation of said cap about said central axis, said means on said sleeve comprising a separate seal ring of elastomeric material in liquid tight engagement with the outer surface of said stem, and said seal ring comprising a container seal having a laterally extending flange for overlying an edge of a container to which said sleeve is to be mounted for providing a seal between said sleeve and the container.

4,984,921

SEALING CAP FOR ELONGATED ROLL-ON PACKAGE

Joseph E. Fattori, Mendham, N.J., assignor to The Mennen Company, Morristown, N.J.

Filed Apr. 3, 1989, Ser. No. 331,856
Int. Cl.[5] B05C *17/02*; A45D *34/04*
U.S. Cl. 401—208 20 Claims



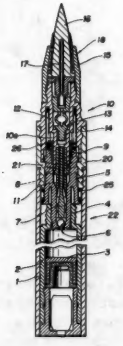
1. A wide roller type roll-on package comprising a container with a wide roller in an opening of the container for dispensing a produce from the container, a non-circular sealing surface extending about the container opening, and a removable sealing cap for closing the opening of the container, said sealing cap comprising a closure, a sealing member arranged within the closure for sealing against the non-circular sealing surface of the container, and an alignment member in the closure for aligning the sealing member with the sealing surface, both the sealing member and alignment member being rotatable relative to the closure.

4,984,922

LIQUID CONTAINER

Shigeo Iizuka, Funabashi, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1989, Ser. No. 400,780
Claims priority, application Japan, Sep. 2, 1988, 63-115832
Int. Cl.[5] A46B *11/00*; A45D *34/00*
U.S. Cl. 401—277 6 Claims



1. A toilet implement comprising:

a container body having a bottom plate fitted into a lower portion of a body portion, said bottom plate capable of vertically moving in water-tight contact with an inner peripheral surface of said body portion;

a cylinder with a suction valve, a lower portion of the cylinder mounted in a mouth portion of the container body;

a member with a piston, said member having a cylindrical piston fitted into said cylinder at a lower end of the member, said member having a discharge valve located in a first cylindrical portion of the cylinder, said member having an outer cylindrical portion suspended from an upper portion of said first cylindrical portion;

a liquid supply means mounted on an upper end of said first cyiindrical portion; and

a shaft having said cylinder and said container body vertically movably inserted therein, said shaft having its upper end portion rotatably fitted in said outer cylindrical portion;

a sine-wave like cam groove peripheral extending over the periphery one of an outer surface of said cylinder and an inner surface of said shaft while a projection engaged in the cam groove is provided on the other; and

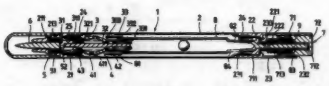
a longitudinal groove in one of an inner surface of said cylinder and an outer surface of said first cylindrical portion of the member with a piston while a longitudinal strip vertically movably engaged in said groove is provided on the other.

4,984,923

LIQUID APPLICATOR WITH AXIAL VALUE ACTUATION

Yoshiyuki Ota, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Nagoya, Japan

Filed Jun. 13, 1989, Ser. No. 365,321
Claims priority, application Japan, Jun. 13, 1988, 63-78098[U]
Int. Cl.[5] A46B *11/00*; B43K *8/02*
U.S. Cl. 401—279 8 Claims



6. A liquid applicator of the type having a liquid container in the rear portion of said applicator, a penpoint in the front section of said applicator, a valve seat having an opening for passing liquid from said container to said penpoint, a valve element adapted to engage and disengage said valve seat for closing and opening said valve, respectively, and an operating member for moving axially in said applicator for controlling the opening and closing of said valve opening; the improvement comprising,

said valve element being downstream of said valve seat; and stretchable means intermediate said operating member and said valve seat for moving said valve element rearwardly away from said valve seat when said operating member moves forwardly, and moving said valve element forward toward said valve seat when said operating member moves rearwardly.

4,984,924

LOOSE LEAF HOLDER

Moshe Erlich, 66 Shai Agnon Street, Herzliya, Israel

Filed Nov. 18, 1988, Ser. No. 273,025
Claims priority, application Israel, Nov. 23, 1987, 84573
Int. Cl.[5] B42F *3/00*
U.S. Cl. 402—4 12 Claims

1. A ring binder assembly comprising:

a ring binder comprising rodlike mounting elements mounted on a common base and lying along a predetermined axis;

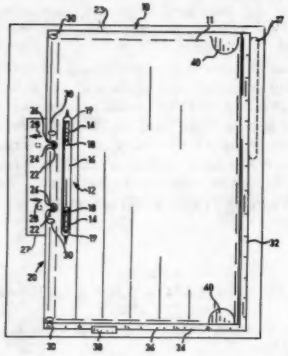
a plurality of loose leaf holders, each comprising:

a planar member;

means associated with an edge of said planar member for detachably mounting said planar member onto said mounting elements without requiring opening of said elements by applying to said planar member a force hav-

ing a component at right angles to said predetermined axis;

means for removably engaging onto said planar member at least one loose leaf having a predetermined configuration with at least two engagement apertures and at least two



corners, said means being adapted to engage at least two of the engagement apertures; and

corner engaging flaps associated with said planar member for removably engaging onto said planar member at least two corners of a loose leaf.

4,984,925

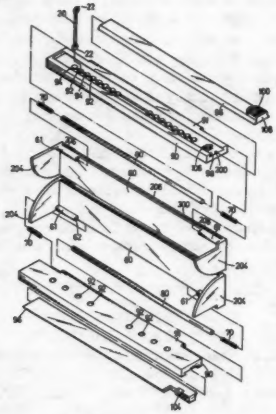
STRUCTURE OF BINDING CLIP

Alan Chen, No. 52, Lane 136, Sanmin Rd., Taipei, Taiwan

Filed Jan. 9, 1990, Ser. No. 461,639

Int. Cl.[5] B42F *3/00*

U.S. Cl. 402—8 **4 Claims**



1. A binding clip for binding up loose-leaf sheets, including:

a plurality of compression springs;

a plurality of wire rods, each having two opposite snap members at its both ends;

a plurality of dove-tail slide blocks, each having a thumb knob at its one end on its upper side, and a female fastening member at its bottom side right below said thumb knob;

a plurality of positioning plates, each having thereon a dove-tail slide for sliding therein of either one of said slide blocks, and an axle housing at its one lateral side, said dove-tail slide having thereon a male fastening member for engaging with said female fastening member of either one of said dove-tail slide blocks, a plurality of through-holes, and a plurality of blind holes, said through-holes and said blind holes being interjected with one another;

one set of symmetric clamping elements, each having two curved bumpers vertically disposed at its both ends and a pair of axle housing inward extending from said two curved bumpers; and

a plurality of axles;

wherein said compression springs are respectively inserted into the axle housings of said clamping elements; said axles are respectively inserted through the axle housings of said positioning plates and have their both ends respectively set in the axle housings of said clamping elements to secure said positioning plates to said clamping elements respectively; said wire rods are respectively inserted through the through-holes of said positioning plates with their snap members alternatively set in the blind holes therof so as to secure loose-leaf sheets to said clamping elements; said dove-tail slide blocks are respectively inserted in the dove-tail slides of said positioning plates.

4,984,926

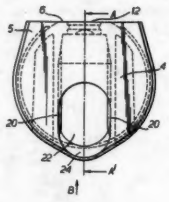
CONNECTOR FOR SECURING FURNITURE PANELS AT RIGHT ANGLES TO ONE ANOTHER

David N. Harley, Dorset, England, assignor to Titus Tool Company Limited, Buckinghamshire, England

Filed Dec. 7, 1989, Ser. No. 447,474

Int. Cl.[5] B25G *3/00*; F16B *7/08, 37/00*

U.S. Cl. 403—8 **7 Claims**



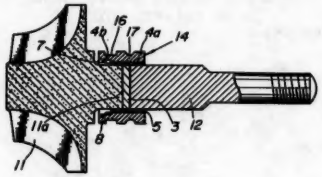
1. A securing device for securing panels at right angles to each other, comprising a holding member adapted to be fitted in a recess provided in a major surface of one of said panels, said holding member comprising a plug-like body portion having a front wall exposed at an edge of said one panel and positioned substantially flush therein, a chamber extending through the full length of the body portion from a first opening in the front wall to a second opening opposite the front wall, said chamber being adapted to retain a securing member within the body portion, the holding member also being provided with a top wall arranged to be exposed at a major surface of the panel and having a third opening therein extending into the body portion and connecting with said chamber, said third opening adapted to enable insertion of the securing member in the chamber and provide access for driving the securing member to engage the second panel, and draw it towards the first panel, and said second opening providing alternative access for insertion of the securing member in the chamber prior to positioning of the securing device in the panel recess, said second and third openings being separated by a bridge portion.

4,984,927

CERAMIC AND METAL JOINING STRUCTURE

Takio Kojima, and Masaya Ito, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 908,205, Sep. 17, 1986, abandoned. This application Feb. 17, 1989, Ser. No. 312,383
Claims priority, application Japan, Sep. 30, 1985, 60-219580
Int. Cl.[5] F16B *9/00*; F01D *5/28*
U.S. Cl. 403—30 18 Claims



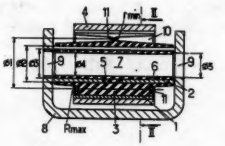
1. A ceramic and metal sleeve assembly comprising:
a ceramic shaft;
a metal sleeve installed on said ceramic shaft and having inner and outer circumferential walls and an annular groove in said outer circumferential wall at a predetermined axial position with respect to one axial end of said ceramic shaft; and
means for securely joining part of said inner circumferential wall of said metal sleeve to said ceramic shaft, including a joint disposed between said ceramic shaft and said metal sleeve and axially positioned in such a manner that an axial end of the joint, where said inner circumferential wall of said metal sleeve is securely joined to said ceramic shaft, is positioned between opposite axial ends of said metal sleeve and between opposite axial ends of said ceramic shaft at a position which substantially corresponds with the axial position of said annular groove, wherein a space is defined between said axial end of said joint and one of said axial ends of said metal sleeve and being open to ambient atmosphere surrounding said metal sleeve.

4,984,928

RESILIENT JOINT WITH DIFFERENTIATED RADIAL STIFFNESS

Michel Domer, Valdampierre, France, assignor to Hutchinson, France

Filed Dec. 21, 1989, Ser. No. 452,821
Claims priority, application France, Dec. 21, 1988, 88 16917
Int. Cl.[5] F16B *1/100*
U.S. Cl. 403—228 7 Claims



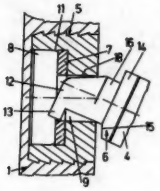
1. A resilient joint having differentiated radial stiffness comprising:
an outer tubular frame and an inner tubular frame which are coaxial at rest about an axial axis; and
a resilient material block bonded between said inner and outer tubular frames whereby when said inner and outer tubular frames are caused to pivot with respect to each other about the axial axis said material block is subjected to a shearing action, said material block including, in a peripheral portion thereof located between said inner and outer tubular frames, variations in axial thickness forming ridges and hollows with the variations being progressive and continuous along the ridges and hollows.

4,984,929

FITTING FOR FASTENING THE RAIL MEMBER OF A DRAWER

Erich Röck, Höchst, and Helmut Hollenstein, Lustenau, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst, Austria

Continuation of Ser. No. 134,303, Dec. 15, 1987, abandoned. This application May 16, 1989, Ser. No. 353,207
Claims priority, application Austria, Jan. 8, 1987, 19/87
Int. Cl.[5] F16B *12/24*
U.S. Cl. 403—230 6 Claims



1. A fitting for fastening an end of a rail member of a drawer to a front plate or to a rear wall of the drawer, said fitting comprising:
a circumferentially closed dowel casing to be fitted into the front plate or rear wall of the drawer, said dowel casing having a hollow interior and a circumferentially closed circular opening extending through said dowel casing axially centrally thereof into said interior;
a hook member to be at a respective end of the rail member of the drawer, said hook member including a head having a hook extending through said circular opening in said dowel casing to a fastened position to fasten said hook member to said dowel casing, said hook having a circumferential dimension extending along only a portion of the circumference of said hook member, said hook member extending in the axial direction of said dowel casing and having a cylindrical shoulder snugly received in said circular opening when said hook member is in said fastened position, and said head having a beveled portion at a position radially opposite said hook to permit insertion of said hook through said circular opening, said beveled portion extending from a free end of said hook member to a position axially beyond said hook; and
an abutment surface within said interior to be abutted by said hook, said abutment surface extending entirely around the circumference of said circular opening.

4,984,930

BALL JOINT STUD ASSEMBLY

Frederick D. Connor, Herongate, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 20, 1989, Ser. No. 382,867
Claims priority, application United Kingdom, Jul. 22, 1988, 8818081
Int. Cl.[5] F16B *2/02*
U.S. Cl. 403—290 10 Claims

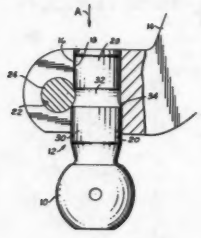
1. A ball joint stud assembly comprising:
a shank having a ball formed at one end thereof, said shank having first and second axially separated surfaces with said first surface, which is located furthest from said ball, having a diameter smaller than said second surface, and

with said surfaces being separated by a circumferential groove;

a mounting component for receiving and securing at least a portion of said shank therein, said mounting component having:

a first bore for receiving said shank, said first bore having axially spaced sections of different diameters which approximately correspond to said first and second surfaces of said shank;

a second bore perpendicular to said first bore and intersecting said first bore; and



a slot projecting radially from said first bore to an edge of said mounting component such that said slot intersects with said second bore; and

a clamping bolt means for reducing the diameters of said first bore and securing said shank therein upon tightening of said clamping bolt means, wherein a portion of said clamping bolt means is disposed in said second bore and engages and additionally secures said shank by being disposed in said circumferential groove.

4,984,931

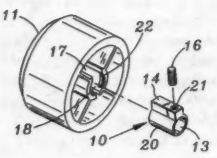
CONTROL KNOB AND ADAPTOR ASSEMBLY

Scott Struthers, San Clemente; Jerry Curtis, Buena Park, and Jack Reed, Lake Elsinore, all of Calif., assignors to Dana Innovations, San Clemente, Calif.

Filed Dec. 26, 1989, Ser. No. 456,496

Int. Cl.[5] B25G *3/02*

U.S. Cl. 403—362 **1 Claim**



1. A control knob adaptor assembly for providing axial position adjustment of a know relative to the length of a switch shaft comprising:

(a) a collar having a central opening formed therein to receive the switch shaft, said collar being disposable at varying positions along the shaft length and having a key formed in the outer surface thereof to engage a central opening formed on an inner surface of the knob;

(b) a knob having a central opening formed therein, the central opening having a keyway formed therein, said keyway being formed to receive the key formed on the collar outer surface, said knob further having a detent within the knob central opening, said detent providing snap engagment of said knob to said collar when said collar is fully received within said knob; and

(c) a set screw extendable through said collar for securing said collar in place along the length of the switch shaft.

4,984,932

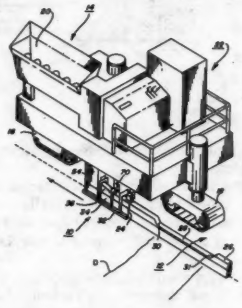
APPARATUS FOR CONTINUOUS FORMATION OF CONCRETE CURBS

John Leone, 635 Hopkins Rd., Amherst, N.Y. 14221

Filed Mar. 28, 1989, Ser. No. 329,861

Int. Cl.[5] E01C *11/02*

U.S. Cl. 404—72 **4 Claims**



1. A method of producing a curb along a roadbed along which are positioned driveways, comprising the steps of

moving a multi-sided curb casting mold along the edge of the roadbed,

extruding curbing material from said mold continuously along the roadbed before reaching a driveway from the discharge and of the molding device,

lowering said molding device as the same approaches the oncoming edge of a driveway to form a generally downwardly top tapering top surface on the curb,

moving said molding device across the driveway,

raising said molding device after the same reaches the other side of the driveway to form a generally upwardly tapering top surface on the curb, and

commencing formation of the curb.

4,984,933

GROUTING METHOD AND APPARATUS

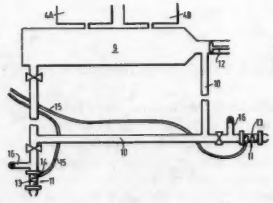
Martin F. Annett, Oxford; Barry France, Hythe, and Tania Stanford, Milton Keynes, all of United Kingdom, assignors to Fosroc International Limited, Birmingham, England

Filed Oct. 2, 1989, Ser. No. 415,945

Claims priority, application United Kingdom, Oct. 3, 1988, 8821395

Int. Cl.[5] E21D *11/00*

U.S. Cl. 405—150 **10 Claims**



1. A method of placing and setting a cementitious material in

an annulus present between a tunnel bore and the lining therein, the annulus containing static or running water, the method comprising supplying into the annulus a cement grout of cement particles, water and an anti-washout retarder which will surround the particles to protect them from being washed out of the annulus, the retarder being present in an amount of about 0.25% by weight of the dry cement, and, at or immediately before placement adding a gelling agent therefor, the content of the gelling agent being selected relative to the retarder so that the cement will set rapidly to develop high compressive strength.

4,984,934

PIPELINE LAYING SYSTEM AND VESSEL AND METHOD OF SPOOLING LINES ONTO THE VESSEL

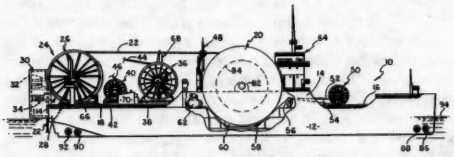
Carlos E. Recalde, Irvine, Calif., assignor to Sante Fe International Corporation, Alhambra, Calif.

Division of Ser. No. 48,454, May 11, 1987, Pat. No. 4,820,082, which is a continuation of Ser. No. 757,790, Jul. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,112, Aug. 31, 1984, Pat. No. 4,687,376. This application Nov. 7, 1988, Ser. No. 267,973

The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.

Int. Cl.[5] F16L *1/04;* B63B *35/04*

U.S. Cl. 405—168 **4 Claims**



1. The method of spooling a plurality of operational lines onto a vessel having a plurality of reels for the storage of operational lines, at least one of which lines is a rigid walled pipeline, and the vessel having a feeding device including a level wind means for the at least one rigid walled pipeline and including a pipeline support means with a drum for providing moving contact with each of the plurality of operational lines in sequence during spooling, and motive means for each of the storage reels; the method comprising the steps of:

placing the operational lines sequentially in contact with the pipeline support means;

connecting the plurality of operational lines onto the individual storage reels;

operating the motive means to cause said reels to sequentially spool up the operational lines;

maintaining moving contact between the rigid walled pipeline and the drum of the pipeline support means as the pipeline is spooled onto a reel by moving the pipeline past the drum around an arcuate turn defined by the surface of the drum with the pipeline and drum moving about the same axis; and

during the operation of the motive means, causing the feeding device to level wind with respect to the vessel's longitudinal axis to cause the rigid walled pipeline to move transversely with respect to the vessel's longitudinal axis during said spooling step.

4,984,935

FLOATING ENCLOSED OFFSHORE SUPPORT STRUCTURE

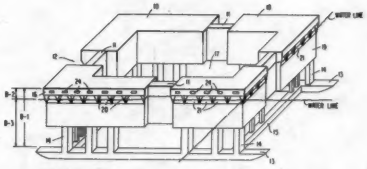
Florêncio de Oliveira Filho, Curitiba, and Valtair P. L. Pires, Rio de Janeiro, both of Brazil, assignors to Petroleo Brasileiro S.A. -Petrobras, Rio de Janeiro and Empresa de Portos do Brasil S.A. -Portobras, Brasilia, both of, Brazil

Filed Dec. 22, 1987, Ser. No. 136,324

Claims priority, application Brazil, Dec. 22, 1986, 18606370

Int. Cl.[5] B63B *35/44;* E02B *3/06*

U.S. Cl. 405—224 **11 Claims**



1. A floating enclosed offshore support structure for stabilized mooring at any point in the ocean by fastening the support structure to the bottom of the sea, said structure comprising:

an upper metallic platform (10) taking the shape of an open square in plan configuration defining an internally open interior (17) and having at least one entrance opening communicating the interior (17) to the exterior ocean, said at least one entrance opening being within a face facing the direction of oncoming waves, said platform face being defined by three distinct parts;

(a) a vertical flat wall (16) located in an upper part of said face;

(b) an intermediate wall (18) formed by a plurality of protruding elements (20) shaped as a section of a tetrahedron as seen by the oncoming waves and by openings (21) between said protruding elements and limited on both sides by lateral walls of adjacent, laterally spaced protruding elements (20), said openings (21) communicating the exterior ocean with, a vertical inner channel (23) within the portion of the platform formed by said vertical flat wall, each inner channel corresponding to each opening and cut in the interior of the platform, through which the water may penetrate violently under the effect of the waves, said inner channel being partially defined by an inner wall shaped to absorb and dampen the force of the incoming water into the opening (21) and the inner channel (23), and at least one special opening (24) communicating with said inner channel (23) to let the water penetrating into the open space (23) to flow through said at least one special opening (24) onto the exterior face of the vertical flat wall (16); and

(c) a lower wall (19), flat and vertical, located immediately under the intermediate wall (18) and which, when the structure is positioned in the ocean, stays fully submerged;

said structure further comprising a float system (13) for supporting the platform (10) including floats and spaced columns (14) connecting said floats to said platform such that the floating platform (10) is stabilized over an ocean spot with said floats remaining fully submerged;

a cable system comprising multiple cables (C_1, C_2, $C_3 \ldots C_n$) linking said floating structure to mooring piles (E_1, E_2, $E_3 \ldots E_n$) fastened to the bottom of the sea, said cables having upper ends fastened to points in the bottom of the floats, and lower ends tied to respective mooring piles.

4,984,936

STOPPER APPARATUS FOR ROTARY REACTION FORCE

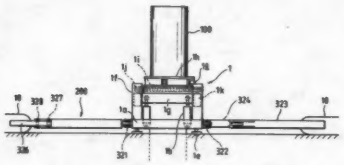
Hiroshi Kusumi; Satoshi Nozaki, both of Ibaraki, and Muneo Yoshida, Chiba, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1989, Ser. No. 378,559

Claims priority, application Japan, Jul. 19, 1988, 63-96252; Dec. 15, 1988, 63-162831; Dec. 23, 1988, 63-167227

Int. Cl.[5] E02D *11/00*

U.S. Cl. 405—232 26 Claims



1. A stopper apparatus for neutralizing rotary reaction force set up by the rotation of a casing in a casing driver, comprising:

at least one elongated transmission frame for transmitting the rotary reaction force, one end of said transmission frame being connected to a casing driver unit, and an opposite end thereof being supported by a rotary reaction force supporting mass, said rotary reaction force supporting mass being disposed at a position remote with respect to said casing driver unit such that said rotary reaction force is received by said opposite end of said elongated transmission frame and in turn by said rotary reaction force supporting mass.

4,984,937

ROCK BOLT

Walter Karpellus, Innsbruck, Austria, assignor to Ingenieure Mayreder, Kraus & Co. Baugesellschaft m.b.H., Vienna, Austria

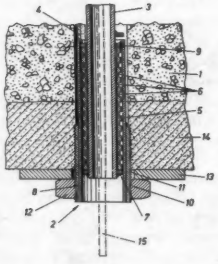
PCT No. PCT/AT88/00097, § 371 Date Jul. 11, 1989, § 102(e) Date Jul. 11, 1989, PCT Pub. No. WO89/04911, PCT Pub. Date Jun. 1, 1989

PCT Filed Nov. 15, 1988, Ser. No. 391,579

Claims priority, application Austria, Nov. 16, 1987, 3020/87

Int. Cl.[5] E21D *21/02*

U.S. Cl. 405—260 7 Claims



1. A rock bolt comprising a bolt rod adapted to be secured in a borehole, a retaining plate adapted to be attached outside the borehole, a bolt head for the retaining plate, and a supporting connection between the bolt rod and the retaining plate, the supporting connection comprising a tubular member adapted to be inserted into the bore hole, the tubular member having an outer end and an inner end, the outer tubular member end bearing on the retaining plate, and a compressively loaded, deformable and upsettable sleeve member accommodated with a clearance in the tubular member and held between a rodside thrust face and a plateside thrust face constituted by a collar adjacent the inner tubular member end.

4,984,938

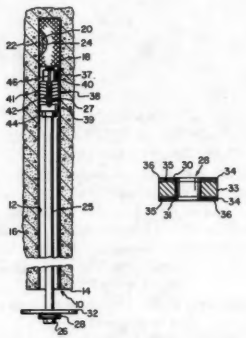
COATED WASHER FOR AN ANCHOR BOLT SYSTEM

Ralph F. Scott, Jr., Corsopolis, and Frank M. Locotos, Bridgeville, both of Pa., assignors to H&S Machine & Supply Company, Inc., Corsopolis and F.M.Locotos Co., Inc., McMurray, both of, Pa.

Continuation of Ser. No. 236,517, Aug. 25, 1988. This application Sep. 28, 1989, Ser. No. 414,184

Int. Cl.[5] E21D *20/02*

U.S. Cl. 405—261 14 Claims



1. In an anchor bolt assembly for insertion into a pre-drilled hole of a rock formation within a mine and comprising an elongated roof bolt having a head at one end external of the hole, a bearing plate having a central opening and positioned on said bolt to engage a face of said rock formation and a two-faced hardened steel washer positioned on said bolt between said bolt head and said bearing plate, the improvement comprising a coating formed of a dry graphite lubricant suspension on both faces of said washer, wherein said anchor bolt assembly being tensioned and the washer acting to reduce friction between said bolt head and said plate to improve the torque-tension relationship.

4,984,939

PNEUMATIC TUBE TRANSMISSION SYSTEM WITH SLOW-DOWN BLOWER

Michael J. Foreman, Carrollton, and Harold R. Greene, Farmers Branch, both of Tex., assignors to ComCo Systems, Dallas, Tex.

Filed May 1, 1989, Ser. No. 345,403

Int. Cl.[5] B65G *51/20, 51/34*

U.S. Cl. 406—84 15 Claims

14. A pneumatic transmission system comprising:

a transmission line having a channel formed therethrough, said transmission line having a first end and a second end, said second end being subjected to ambient pressure;

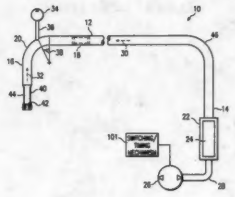
a reversible blower adapted to alternately provide pressurized air and a vacuum to said first end of said transmission line, said reversible blower connected to said first end of said transmission line, and said reversible blower having a predetermined air capacity;

a first terminal interconnected to said first end of said transmission line, said first terminal having an aperture formed therethrough whereby a carrier can be readily inserted or removed from said first terminal;

a curved transmission line section having a channel formed

therethrough disposed between said first end and said second end of said transmission line;

a vacuum source having an air capacity at least as great as the air capacity of said blower, said vacuum source interconnected to said channel formed through said transmission line at a position proximal said second end relative to said blower, whereby said vacuum source creates a flow of air from said second end to said vacuum source through



said channel formed through said transmission line during operation of said blower and said vacuum source, and whereby said flow of air from said second end to said vacuum source decelerates a carrier moving from said first end to said second end of said transmission line;

a second terminal interconnected to said second end of said transmission line, said second terminal comprising an end block and having an access port formed therethrough.

4,984,940

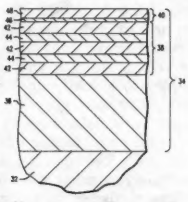
MULTILAYER COATED CEMENTED CARBIDE CUTTING INSERT

William A. Bryant, McKeesport, and George P. Grab, Greensburg, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 324,847, Mar. 17, 1989, abandoned. This application Jan. 8, 1990, Ser. No. 461,712

Int. Cl.[5] B23B *27/14*

U.S. Cl. 407—119 **13 Claims**



1. A cutting insert comprising:

a body having a rake face and a flank face;

a cutting edge at a junction of said rake face and said flank face;

said body composed of:

a cemented carbide substrate consisting essentially of tungsten carbide grains, solid solution carbide grains containing tungsten and an element selected from the group consisting of titanium, tantalum, niobium, zirconium and hafnium, alone or together, and 6.1 to 6.5 weight percent cobalt; said substrate having a hardness of 90.8 to 91.6 Rockwell A and a magnetic coercive force of 110 to 180 oerstads;

a coating bonded to said substrate;

said coating including a backing layer bonded to said substrate, having a thickness of at least 5μ, and selected from the group consisting of the carbides, carbonitrides of titanium, hafnium and zirconium, alone or in combination;

an active layer composed of alternating sublayers including at least a plurality of alumina sublayers separated from each other by an intermediate sublayer selected from the group consisting of the nitrides of titanium, zirconium and hafnium, alone or in combination, and said first aluminua sublayer bonded to said second layer;

a finish layer bonded to the outermost alumina layer; said finish layer selected from the group consisting of the carbonitrides and nitrides of titanium, hafnium and zirconium, alone or in combination;

wherein said alumina in said sublayer has an average grain size of between about 0.15 to 0.5 μ.

4,984,941

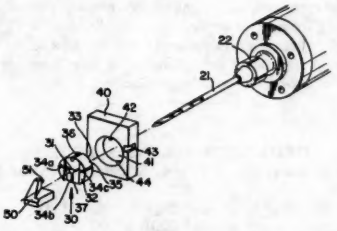
APPARATUS FOR FORMING A SUTURE CUT-OFF FEATURE IN A SURGICAL NEEDLE POSSESSING A SUTURE-RECEIVING SOCKET

Edward C. White, Orange; Douglas T. Blake, Milford, and Michael C. Grassel, New Milford, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Mar. 2, 1989, Ser. No. 317,949

Int. Cl.[5] B23B *47/28*

U.S. Cl. 408—104 **11 Claims**



1. An apparatus for forming a suture cutting edge at the entrance of a suture -receiving socket formed in the blunt end of a surgical needle which comprises:

(a) tool means for forming the suture cutting edge;

(b) surgical needle receiving and holding means which, in a locked position, accurately maintains the position of the socketed end of the needle relative to the tool means during the suture cutting edge forming operation, the surgical needle receiving and holding means comprising a conical shaped collet possessing an axially extending, centrally disposed needle-receiving bore for its full length and open at each end thereof, the collet possessing a plurality of slots extending from its front to its rear face and capable of undergoing compression upon application of a compressive force to firmly lock the blunt end of the needle within the bore;

(c) means for locking the socketed end of the needle within the surgical needle receiving and holding means; and,

(d) means for advancing the tool means relative to the socketed end of the needle by a predetermined distance

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4,984,942

TAP WRENCH

Leonard Holtz, 9474 Wayside Dr., Sunland, Calif. 91040

Filed Jun. 4, 1990, Ser. No. 533,114

Int. Cl.[5] B23G *1/26*

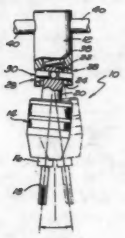
U.S. Cl. 408—127 **15 Claims**

5. A tap wrench comprising:

a body member providing handle means for applying torque to said body member, said body member having an axially extending cylindrical opening in a first end thereof, said cylindrical opening being defined by a cylindrical wall having four slots equidistantly spaced therearound;

collet means for operatively retaining a tap, said collet

means having expandable jaw members with a tap retained therein at a first end of said collet means and said collet means having a cylindrically shaped shank extending from a second end thereof, said shank having four pins projecting therefrom, with each of said pins being equidistantly spaced about said shank such that all pins lie in one plane that is oriented substantially perpendicular to the



longitudinal axis of said shank, said shank being disposed within said cylindrical opening of said body member such that each of said pins is slidably retained within one of said slots, and such that a gap spaces non-pin portions of said shank from inner surfaces of said cylindrical wall, wherein said collet means is moveable relative to said body member in a manner permitting axial misalignment of said collet means and said body member.

4,984,943

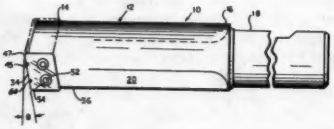
DRILL WITH BALANCED INSERTS

Martin N. Hamilton, R.D. #4, Middle Rd., Meadville, Pa. 16335

Filed May 26, 1989, Ser. No. 357,204

Int. Cl.[5] B23B *51/00*

U.S. Cl. 408—144 **11 Claims**



1. A drill comprising a body having an axis of rotation and a reference plane,

said axis of rotation lying in said reference plane,

a first insert and a second insert,

means supporting said first insert and said second insert on said body,

said first insert having a first cutting edge,

said second insert having a second cutting edge,

said first cutting edge comprising a first curved part and a first straight part tangent to said first curved part and forming a continuation of said first curved part,

said second cutting edge comprising a second curved part and a second straight part tangent to and forming a continuation of said second curved part,

said first cutting edge lying in a first plane,

said second cutting edge lying in a second plane, said first and second planes being parallel to said reference plane and lying on opposite saids thereof

said first plane and said second plane being substantially coextensive with one another and being substantially coextensive with said reference plane,

the first curved part of said first cutting edge substantially overlapping the corresponding second curved part of said second cutting edge adjarent said axis,

said cutting edges being adapted to cut a hole in a stack of plates.

4,984,944

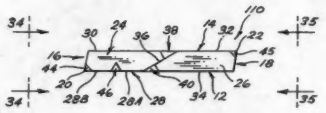
DRILL BIT BLADE FOR MASONRY AND ROCK DRILL

Donald C. Pennington, Jr., and John D. Knox, both of Louisville, Ky., assignors to Vermont American Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 2,428, Sep. 9, 1987, abandoned. This application Apr. 4, 1988, Ser. No. 177,187

Int. Cl.[5] B23B *51/00*

U.S. Cl. 408—223 **18 Claims**



1. A drill bit blade for a masonry and rock drill comprising:

first and second planar lateral side surfaces;

first and second flank end surfaces;

first and second tip face surfaces converging from the first and second flank end surfaces, respectively, to the center of the drill bit blade, the first tip face surface being disposed at an acute included angle to the first lateral side surface defining a first lateral cutting edge at the intersection of the first tip face surface and the first lateral side surface, and the first tip face surface being disposed at an obtuse included angle to the second lateral side surface defining a first trailing lateral edge at the intersection of the first tip face surface and the second lateral side surface parallel to the first lateral cutting edge, the second tip face surface being disposed at an acute included angle to the second lateral side surface defining a second lateral cutting edge at the intersection of the second tip face surface and the second lateral side surface, and the second tip face surface being disposed at an obtuse included angle to the first lateral side surface defining a second trailing lateral edge at the intersection of the second tip face surface and the first lateral side surface parallel to the second lateral cutting edge, and the intersection of the first and second tip face surfaces defining a chisel edge extending diagonally across the drill bit blade from the first lateral cutting edge to the second lateral cutting edge;

a first V-shaped notch formed in the first lateral trailing edge immediately adjacent the chisel cutting edge such that one straight edge of the first notch is formed in the first tip face surface and the other straight edge of the first notch is coincidental with the chisel cutting edge; and

a second V-shaped notch formed in the second lateral trailing edge immediately adjacent the chisel cutting edge such that one straight edge of the second notch is formed in the second tip face and the other straight edge of the second notch is coincidental with the chisel cutting edge.

4,984,945

EXPANSION DOWEL ASSEMBLY

Arndt Bergner, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft

Filed Sep. 22, 1988, Ser. No. 247,957

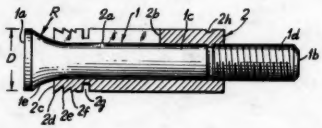
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1987, 3731818

Int. Cl.[5] F16B *13/04, 13/06*

U.S. Cl. 411—30 **5 Claims**

1. Expansion dowel assembly comprising an axially elongated anchor bolt having a leading end and a trailing end spaced apart in the axial direction, an expanding member located at the leading end of said anchor bolt and widening in the direction toward the leading end, an axially elongated shank extending from said expanding member toward the trailing

end, means on said shank adjacent the trailing end for attaching a load on said anchor bolt, an axially extending expansion sleeve laterally enclosing said anchor bolt and being axially displaceable relative to said anchor bolt, said expansion sleeve having a leading end closer to the leading end of said anchor bolt and a trailing end closer to the trailing end of said anchor bolt with slots in said expansion sleeve extending from the leading end toward the trailing end, said expansion sleeve having an inside diameter corresponding to and in displaceable relation with the exterior diameter of said shank, said expansion sleeve having an axially extending outer surface with a circumferentially extending first cutting tooth thereon at the leading end thereof, wherein the improvement comprises that



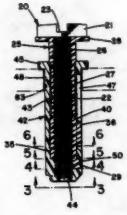
said expanding member has a concavely curved axial extending surface, at least one additional cutting tooth on the outer surface adjoining said first cutting tooth and located on the opposite side of said first cutting tooth from the leading end of said sleeve and within the axial extent of said slots, and said cutting teeth form a sawtooth-shaped section facing outwardly from the outer surface of the said expansion sleeve, said expansion sleeve has a cross-sectional reduction therein spaced from and located closely adjacent to and on the opposite side of said cutting teeth from the leading end of said sleeve, said cross-sectional reduction is formed by a circumferentially extending annular groove in the outside surface of said expansion sleeve within the axial extent of said slots.

4,984,946

BLIND FASTENER

Ronald W. Phillips, II, Mogadore, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Nov. 13, 1989, Ser. No. 435,919
Int. Cl.[5] F16B *13/04, 37/04*
U.S. Cl. 411—34 **7 Claims**



1. A blind fastener system for connecting a threaded member to a relatively thin, plate-like workpiece having a hole and an accessible surface comprising:

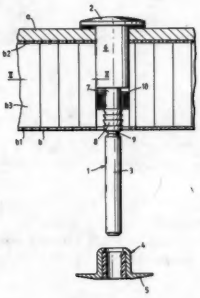
an outer sleeve, said outer sleeve having an upper flange for seating on said accessible surface and a lower deformable portion for bulging into engagement with that side of said workpiece that is opposite to said accessible surface, an inner sleeve journaled in said outer sleeve, rotary locking means interconnecting said inner sleeve to said outer sleeve to prevent relative rotation of said sleeves, axial locking means interconnecting said inner sleeve to said outer sleeve to prevent relative axial movement therebetween, said inner sleeve having a threaded central bore for connection to a threaded bolt such that on linear movement of said bolt and said inner sleeve relative to said flange of said outer sleeve provides a deformation and bulging of said outer sleeve, said inner sleeve has a circumferential extending score line along the mid-portion thereof to define an upper portion and a lower portion wherein said score line breaks said inner sleeve to separate said upper portion from said lower portion.

4,984,947

FASTENER

Daniel J. N. Flaurand, Taverny, France, assignor to Avdel Systems Limited, Welwyn Garden City, England

Filed Jan. 30, 1990, Ser. No. 472,249
Claims priority, application France, Feb. 1, 1989, 89 01269
Int. Cl.[5] F16B *13/04, 21/00*
U.S. Cl. 411—43 **7 Claims**



1. A fastener which comprises:

a bolt having a shank and a head at one end,

a flanged tubular body into which the shank of the bolt can be inserted, the bolt and the body having mutually interengageable engaging means whereby, on forcing the body along the shank and towards the head of the bolt so as to cause the engaging means to interengage, the body and bolt are lockable together so as to fasten together apertured work members disposed on the bolt between the head of the bolt and the flange of the body, and

an axially deformable tubular spacer means for limiting to a predetermined maximum the amount of axial force which can be applied to set the fastener, which spacer means is disposed on the bolt between the head and the body, and when the body is forced into locking engagement with the bolt,abuts the body and is deformed in an axial direction by axial compression, the spacer means being adapted to absorb a substantial amount of the force applied in moving the body along the bolt and setting the fastener, and thereby reduce the amount of force applied to the work members.

4,984,948

BINDING AND COLLATING TECHNIQUES

Robert J. Lindsay, Duluth; Rodney E. Bell, Wilburn, and William McNickle, Marietta, all of Ga., assignors to Foote & Davies, Inc., Atlanta, Ga.

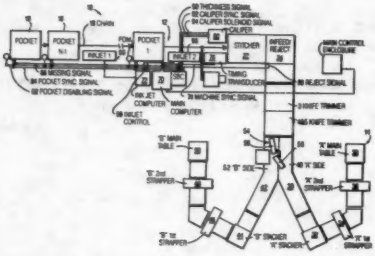
Filed Dec. 22, 1989, Ser. No. 455,005
Int. Cl.[5] B42B *2/00, 4/00*; B42C *1/12*
U.S. Cl. 412—1 **17 Claims**

1. A method for collating and binding a plurality of books addressed to at least two sets of addressees, each set to receive a different version of the books, comprising the steps of:

(a) obtaining a plurality of data records corresponding to the addressees;

(b) organizing the records into a plurality of zone packages corresponding to a first zone level;

(c) for each package, pairing address records in that package into pairs of the same book version;
(d) transferring the unpaired address records in the packages into at least one zone package corresponding to a level higher than the first zone level and pairing the unpaired address records;
(e) providing the packages for output;



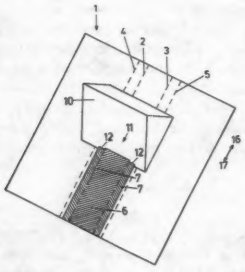
(f) forming the books simultaneously in pairs utilizing the output data to produce a first and a second output stream of books;
(g) interposing each book from the second output stream into the first output stream adjacent to its pair-complement book in order to form a single output stream; and
(h) organizing and packaging the books into zone packages.

4,984,949

CONTINUOUS BOOKBINDING PROCESS USING A MOISTURE CURABLE POLYURETHANE ADHESIVE

Erich Reckziegel, Duesseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 74,429, Jul. 2, 1987, abandoned. This application May 19, 1989, Ser. No. 355,895
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3538897
Int. Cl.[5] B42C *9/00*
U.S. Cl. 412—8 **17 Claims**



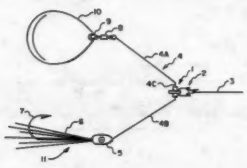
1. A continuous process for book binding in which a block of pages, one of whose edges constitutes a book spine, is adhered to a book cover, consisting essentially of: (A) applying a zone of a hot melt adhesive consisting essentially of a polyurethane resin which cures by crosslinking in the presence of moisture, to a center portion of said book cover which will contact said spine in an amount sufficient to adhere the cover to the spine and in two parallel strips on either side and adjacent to the center portion of the book cover, said strips being at least 0.5 mm wide; and (B) bringing into and maintaining said block and book cover in intimate contact while the hot melt adhesive is in a bondable condition and permitting said polyurethane resin to cure, in the presence of moisture, until adhered to each other.

4,984,950

FISHING LURE HAVING A HINGE PIECE

Carl F. Streed, 628 Green Briar La., Lindenhurst, Ill. 60046

Filed Jan. 19, 1990, Ser. No. 467,737
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.13 **5 Claims**



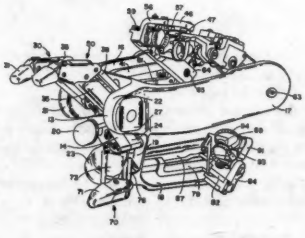
1. A fishing lure comprising a generally V-shaped wire, the V-shape wire having a truncated flat closed intermediate wire portion, the wire further having wire leg portions extending at approximately 45° angles away from opposite ends of said flat closed intermediate wire portion, one of said leg portions having a spinner attached to an outer free end thereof, another of said leg portions having a fishing hook attached to an outer end thereof, a metallic hinge piece having an axial bore extending along a longitudinal axis of said hinge piece, said truncated flat closed intermediate wire portion being extended through said axial bore on said hinge piece and with said wire leg portions acting as stops assisting in maintaining said hinge piece in 360° rotating assembly on said truncated flat closed intermediate wire portion, said hinge piece having an annular table-like flange between opposite ends of the hinge piece and with said annular table-like flange extending radially outwardly of said hinge piece, said annular table-like flange having an axially extending table bore extended there through, an axis of said table bore being parallel to said longitudinal axis of said axial hinge piece base, and a snap secured with said axially extending table bore on said annular table-like flange.

4,984,951

MECHANICAL PREHENSOR

John W. Jameson, Harris County, Tex., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 146,049, Jan. 20, 1988, abandoned. This application Sep. 22, 1989, Ser. No. 412,540
Int. Cl.[5] B25J *3/00*
U.S. Cl. 414—1 **4 Claims**



1. A generally anthropomorphic prehensor mechanically actuated by movements of an operator's fingers comprising:
a first mechanical finger means consisting primarily of a

plurality of shaft members and pivots having at least two finger links adjacent one another and rotatable about parallel axes permitting said first mechanical finger means to move with at least two degrees of freedom in a first plane of movement, and a second mechanical finger means having at least two mechanical finger links adjacent one another and rotatable about parallel axes permitting said second mechanical finger means to move with at least two degrees of freedom in a second plane of movement;

first and second mechanical finger control mechanisms coupled to said first and second mechanical finger means and specifically configured for engagement by a first and second finger of an operator, respectively, for directly projecting movements of the operator's fingers to said mechanical finger means through said plurality of shaft members and pivots, each of said mechanical finger control mechanisms comprising at least two control links corresponding to phalanges of an operator's finger, and adapted to move in response to movement of the corresponding phalanges of an operator's finger;

said prehensor further comprising a support means; first and second mounting means connected to said support means; first and second support ears; and a support palm joining said first and second support ears, said first and second mechanical finger means being mounted to said first and second mounting means, respectively, and said first and second mechanical finger control mechanisms being mounted to said first and second support ears, respectively.

4,984,952

CHARGING APPLIANCE FOR MELTING UNITS

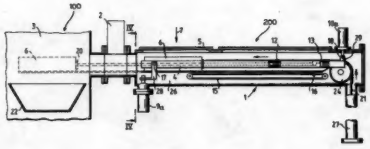
Wolfgang Reuter, Niddatal, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 387,589

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1989, 3908265

Int. Cl.[5] B65G *25/08*

U.S. Cl. 414—180 **23 Claims**



1. A charging appliance for depositing charging stock into a chamber comprising:

a housing affixable to the chamber, said housing having an interior thereof openable to an interior of the chamber;

an acceptance means for receiving charging stock and for transporting charging stock from a first position interior to said housing to a second position interior of the chamber said acceptance means providing a support surface of the charging stock;

a stock mechanism, said stop mechanism mounted for movement with said acceptance means from the first position to the second position, said stop mechanism independently movable with respect to said acceptance means, said stop mechanism positioned on a side of said charging stock trailing the charging stock as the charging stock travels from the first position to the second position, said acceptance means retractable from the second position towards the first position while said stop mechanism is releasably mechanically locked with respect to said housing in an advanced position adjacent to the second position of said charging stock; whereby the support surface is withdrawn from under the charging stock by retracting said acceptance means toward the first position while restraining retraction movement of the charging stock toward the first position by abutting the charging stock against said releasably mechanically locked stop mechanism; and

a motive means for retracting said stop mechanism, once mechanically released, to a base portion interior to said housing on a side of the support surface remote from the chamber.

4,984,953

PLATE-LIKE ARTICLE CONVEYING SYSTEM

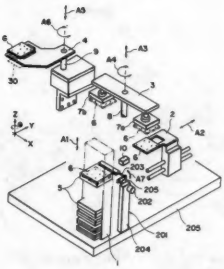
Horoshi Nakazato, OhmeTokyo; Mamoru Iijima, and Akihiro Nakamura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 156,979, Feb. 18, 1988, abandoned. This application Mar. 27, 1990, Ser. No. 500,117

Claims priority, application Japan, Feb. 20, 1987, 62-035747; Feb. 20, 1987, 62-035748; Feb. 20, 1987, 62-035749

Int. Cl.[5] B65G *1/06*

U.S. Cl. 414—331 **2 Claims**



1. A conveying system usable with a plurality of reticles, each having a pattern prepared for manufacture of integrated circuits and each having a bar code that bears information related to the reticle and usable with a plurality of casings, each having an openable door, for accommodating associated reticles therein, said conveying system for conveying a reticle between a first station for reticle keeping and a second station for reticle setting, said system comprising:

a support provided at the first station for supporting the casings in a stacked relationship in a first, substantially vertical direction;

driving means for moving said support in the first direction for displacement to a desired casing to locate a desired reticle at a reticle transfer position which is at a fixed height in said system;

opening means provided at the reticle transfer position for opening an openable door of a casing displaced to the reticle transfer position by said support;

a first hand mechanism comprising a first hand accessible through an opening, defined by the opening of an openable door of a casing displaced to the reticle transfer position, to an inside of that casing to allow transfer of a reticle out of or into that casing, said first hand mechanism further comprising conveying means for conveying a reticle between the reticle transfer position and a first

intermediate position in a second, substantially horizontal direction which is perpendicular to the first direction;

a second hand mechanism comprising a second hand for conveying a reticle between the reticle setting station and a second intermediate position;

aligning means provided on said second hand and having a plurality of engaging members for engaging a peripheral edge of a reticle so as to align the same with respect to the reticle setting station during conveyance of the same by said second hand;

interchanging means for interchanging a first reticle placed at the first intermediate position by said first hand mechanism and a second reticle placed at the second intermediate position by said second hand mechanism, said interchanging means having a rotational shaft for transmitting a rotational drive and a third, rotatable hand which is rotatable about said rotational shaft; and

a bar code reader provided between the reticle transfer position and the first intermediate position for reading a bar code of a reticle during conveyance of the same by said first hand mechanism in the second direction.

4,984,954

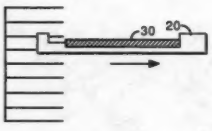
SPATULA FOR WAFER TRANSPORT

Douglas H. Warenback, 78 Chalda Ct., San Rafael, Calif. 94903, and Josef T. Hoog, 252 Calle De La Selva, Novato, Calif. 94949

Continuation of Ser. No. 377,498, Jul. 10, 1989, abandoned, which is a division of Ser. No. 185,730, Apr. 25, 1988, Pat. No. 4,867,631. This application Aug. 3, 1990, Ser. No. 563,742

Int. Cl.[5] B65G *1/10*

U.S. Cl. 414—416 **3 Claims**



1. In a spatula for supporting a semiconductor wafer comprising an elongated blade of predetermined length and thickness and having a width less than the diameter of said wafer, the length of said blade terminating in a free end and a supported end, the improvement comprising:

a recess comprising a reduced thickness portion adjacent to but spaced from the free end of said blade, said recess forming a pair of arcs across the width of the blade, said pair of arcs having a common center and a diameter slightly greater then the diameter of said wafer;

a ridge at said free end, said ridge defining an arc having the same diameter as said pair of arcs but having a center displaced slightly from said common center toward said free end;

whereby said spatula can be inserted between wafers in a cassette to engage a wafer initially with said ridge and remove it slightly so that said spatula can be re-inserted into the cassette to support said wafer in said recess.

4,984,955

LIFT APPARATUS

Robert C. McCullough, 185 Baltic Street, Coquitlan, British Columbia, Canada V3K 5G9

Filed Feb. 23, 1989, Ser. No. 316,337

Int. Cl.[5] B66B *9/20*

U.S. Cl. 414—546 **18 Claims**

14. An apparatus adapted to be mounted to a structure, such as a vehicle, for moving an entity, such as a wheelchair and its occupant, to and from a raised location, said apparatus comprising:

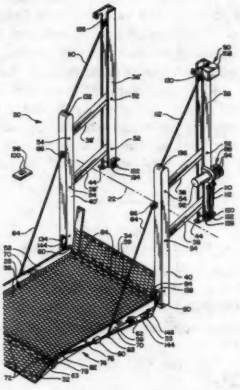
a. a support platform moveable between a lower and an upper position;

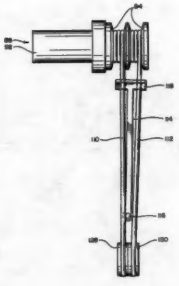
b. a base support structure;

c. a linkage means interconnecting said platform with said base structure to enable said platform to move from the lower position to the upper position, relative to said base structure;

d. actuating means adapted to move said platform relative to said base structure, said actuating means comprising first and second cable means;

e. a cable winding drum means having two laterally spaced first and second drum sections, which are arranged to





have wound thereon said first and second cable means, respectively, said cable winding means further comprising a spacing means having two spaced cable locating means, each of which engages a related cable means to space said cable means a predetermined distance from one another, said cable spacing means being positioned adjacent to said drum means so as to cause said cable means to be wound onto said drum sections at spaced locations corresponding to spacing of said cable locating means on said spacing means, whereby as said drum means rotates to retract said cable means, said cable means are wound on corresponding locations of said drum sections in a manner that said cable means are necessarily wound similarly on said drum sections.

4,984,956

APPARATUS FOR CONTROLLING SPEED OF WORKING MACHINE IN THE FORM OF A CONSTRUCTION MACHINE

Masanori Ikari, Sayama, and Noboru Yajima, Kawagoe, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

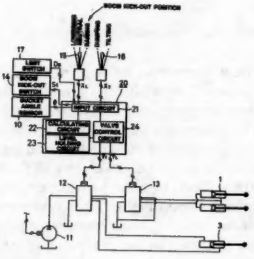
PCT No. PCT/JP88/00292, § 371 Date Nov. 17, 1988, § 102(e) Date Nov. 17, 1988, PCT Pub. No. WO88/07108, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 18, 1988, Ser. No. 295,725

Claims priority, application Japan, Mar. 19, 1987, 62-62543; May 26, 1987, 62-126884

Int. Cl.[5] E02F *3/00*

U.S. Cl. 414—699 8 Claims



1. An apparatus for controlling a speed of a working machine in the form of a construction machine including booms and a bucket to alternately repeating a lifting operation with said booms and a tilting operation with said bucket, said apparatus comprising;

a boom operation lever having a lever holding function for holding said boom operation lever at a predetermined boom kick-out position to generate a boom operation signal corresponding to said boom kick-out position,

a bucket operation lever adapted to generate a bucket operation signal corresponding to said bucket lever position,

boom driving means for driving said booms to lift and lower the latter,

bucket driving means for driving said bucket to tilt the latter and allow the same to dump scooped gravel or the like,

bucket angular speed detecting means for detecting a bucket angular speed during a period in which said bucket operation lever is displaced to the tilting operation side and back to a neutral position,

calculating means for calculating a lift control signal on the basis of a detected value detected by said bucket angular speed detecting means during a preceding bucket tilt period, said lift control signal corresponding to said detected value during a period in which said bucket operation lever is returned to said neutral position, and

controlling means for introducing into said bucket driving means a signal corresponding to a bucket operation signal of said bucket operation lever and introducing into said boom driving means a lift control signal calculated in said calculating means, when said bucket operation lever is in said neutral position and said boom operation lever is maintained at said boom kick-out position.

4,984,957

WORK-IMPLEMENT ADAPTER FOR FRONT LOADER

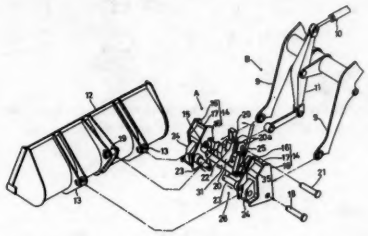
Michio Noguchi; Kazushige Mori; Nobuo Higashino, and Motoki Sunada, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Jun. 21, 1989, Ser. No. 369,593

Claims priority, application Japan, Aug. 8, 1988, 63-197785; Aug. 10, 1988, 63-105596[U]; Sep. 16, 1988, 63-233133; Sep. 16, 1988, 63-121875[U]

Int. Cl.[5] E02F *3/34*

U.S. Cl. 414—723 14 Claims



1. In a work-implement connecting adapter for a front loader connecting at a front portion thereof a front-mount work implement (12) and connecting at rear portions thereof a pair of work-implement lift arms (9, 9) extending from a vehicle body and a work-implement pivot arm (11) disposed at a middle therebetween, the adapter, comprising:

a pair of right and left side brackets (14, 14), each bracket including a pair of plate members (16, 16) rigidly interconnected via a vertical plate frame (17) extending laterally relative to the vehicle body, said side brackets (14, 14) pivotably connecting said pair of work-implement lift arms (9, 9) and a pair of lifting connecting members (13, 13) fixed to the work implement;

a support frame (15) for fixedly connecting between the inner pair of said plate members (16, 16) of the side brackets (14, 14);

connecting portions (24, 24) formed on the vertical plates of the side brackets to fit between sides of said lifting connected members (13, 13), and connecting pins (23, 23) slidable in a horizontal plane for securing said lifting connected members to said right and left side brackets, and

a center connecting bracket (20) disposed at an intermediate portion of said support frame (15) and having at a front portion thereof an engaging hook portion (22) for pivotably connecting a pivoting connected member (19) of the work implement and pivotably connecting said work-implement pivot arm (11) at a rear portion thereof.

4,984,958

CARRIER FRAME FOR A QUICK COUPLER

Edward T. Kaczmarczyk, Welland, Canada, assignor to Deere & Company, Moline, Ill.

Filed Oct. 31, 1989, Ser. No. 429,593

Int. Cl.[5] E02F *3/00*

U.S. Cl. 414—723 19 Claims

1. In a loader having boom arms, connecting structure for mounting an attachment to the boom arms comprising:

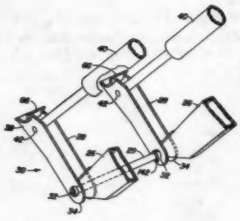
first and second carrier end portions adapted for mating with corresponding receiving portions on the attachment;

means pivotally connecting the end portions to the boom arms for rocking with respect to the arms about a pivotal axis;

means for rocking the end portions about the axis;

a cross member extending between the end portions and means connecting the cross member to the end portions for generally constraining the end portions for rocking together about the axis while permitting limited rocking of

the end portions relative to each other about the axis during mounting to facilitate connection of the attachment to the boom arms; and



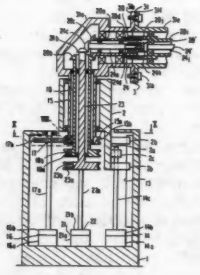
wherein the cross member comprises a semi-rigid tube having an axis which corresponds to the pivotal axis.

4,984,959

INDUSTRIAL ROBOT

Hisao Kato, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Inazawa, Japan

Filed Jul. 12, 1989, Ser. No. 379,030
Claims priority, application Japan, Jul. 13, 1988, 63-174213
Int. Cl.[5] B25J *18/00*
U.S. Cl. 414—744.3 **15 Claims**



11. In an industrial robot of the type having a body, a first joint connected to said body for linear vertical movement relative to said body, actuator means to move said first joint vertically, a first arm portion attached to said first joint for horizontal rotational movement therewith, a second joint attached to said first arm portion and having a part rotatable horizontally relative to said first arm portion, and a second arm portion attached to said rotatable part of said second joint for horizontal rotation therewith; the improvement comprising:

a first joint actuator located within said body;

first joint gear train means located within said body and being connected between said first joint actuator and said first joint for transmitting the energy of said first joint actuator to said first joint to rotate horizontally said first joint and said first arm portion;

a second joint actuator located within said body; and

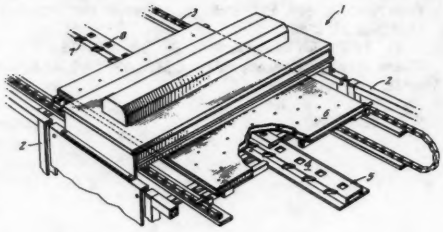
second joint gear train means located within said body, said first joint, said first arm portion, and said second joint for transmitting the energy of said second joint actuator to said rotatable part of said second joint to rotate horizontally said second joint and said second arm portion.

4,984,960

VACUUM TRACK AND PALLETS

Sandor Szarka, Franklin Lakes, N.J., assignor to Precision Screen Machines, Inc., Hawthorne, N.J.

Filed Nov. 29, 1989, Ser. No. 442,920
Int. Cl.[5] B65D *17/00*
U.S. Cl. 414—752 **5 Claims**



1. A vacuum track apparatus comprising:

a frame;

a vacuum duct, supported by said frame, having a plurality of ports spaced longitudinally along the duct;

a vacuum means operatively connected to said vacuum duct adapted to generate a vacuum in said duct;

a pallet advancing means mounted on said frame for moving one or more vacuum pallets over said ports and for positioning the pallets at one or more operating stations; and,

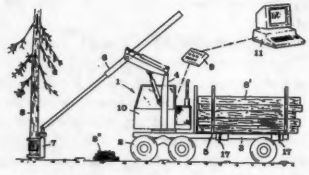
actuating means responsive to the movement of pallets over said ports for opening and closing said ports, said actuating means mounted to said duct and adapted to individually open said ports when a pallet is passing thereover and to otherwise keep said ports closed.

4,984,961

METHOD FOR HANDLING AND TRANSPORTING LOGS FROM FELLING SITE TO CONSUMER, AND ROAD VEHICLE FOR CARRYING OUT THE METHOD

Olof Herolf, Sundsvall, Sweden, assignor to OSA AB, Alfta, Sweden

PCT No. PCT/SE88/00316, § 371 Date Mar. 23, 1989, § 102(e) Date Mar. 23, 1989, PCT Pub. No. WO89/00808, PCT Pub. Date Feb. 9, 1989
PCT Filed Jun. 13, 1988, Ser. No. 346,995
Claims priority, application Sweden, Jul. 24, 1987, 8702957
Int. Cl.[5] A01G *23/08*; B60P *1/48*
U.S. Cl. 414—786 **5 Claims**



1. In a method of handling and transporting logs from a felling site to a consumer, wherein logs are cut by a tree processing device, the diameter and length of individual logs are measured by a sensing means associated with said tree processing device to generate diameter and length measurement data, said diameter and length measurement data are recorded in measuring and data recording device, and the individual logs whose diameter and length measurements have been recorded are first loaded at said felling site onto a cross-country log carrying vehicle, transported to a second site wherein said logs

are unloaded from said cross-country vehicle and reloaded on a log transporting road vehicle for delivery to a consumer, the improvement which comprises:

forming a unitary movable and transferrable bundle of said individual logs on said cross-country log carrying vehicle;

marking or coding said unitary bundle of said individual logs to identify said bundle relative to the data recorded in said data recording device;

transporting the resulting marked or coded unitary bundle of individual logs on said cross-country log carrying vehicle from said felling site to said second site;

unloading the marked or coded unitary bundle of individual logs from said cross-country log carrying vehicle as an integral bundle;

reloading the marked or coded unitary bundle or individual logs to a log transporting road vehicle with said unitary bundle remaining intact; and

transporting the reloaded marked or coded unitary bundle of individual logs to a consumer.

4,984,962

METHOD FOR THE FORMATION OF A TRANSPORT UNIT

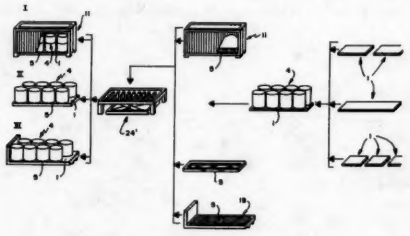
Pekka Järvinen, Nummela, Finland, assignor to Ominen Oy, Vesme, Finland

Filed Sep. 2, 1988, Ser. No. 246,545

Claims priority, application Finland, Jan. 5, 1987, 870016

Int. Cl.[5] B65G *67/02*

U.S. Cl. 414—786 **4 Claims**



1. A method for the formation of a transport unit which includes a bed assembly and a cargo placed thereupon, said method comprising the steps of:

placing a cargo on a first bed having a plate-like structure;

providing a transport container having an interior defined by opposed sides, a top wall, an end wall, and a bottom wall defined by a second bed, said second bed having a grid structure with a plurality of openings;

positioning said transport container with said second bed on a top of a handling mechanism;

positioning a transfer means connected with said handling mechanism above the top surface of said second bed inside the interior of said transport container by raising the transfer means through the grid structure of said second bed;

carrying said cargo and said first bed by means of said transfer means above said second bed inside the interior of said transport container; and

displacing said transfer means relative to said second bed below its top surface by lowering said transfer means through the grid structure of said second bed, whereby said first bed along with its cargo is set upon said second bed to be supported thereby, whereupon said transport unit is formed by said transport container provided with a unitary bottom defined by said first and second beds.

4,984,963

STACKING BUNDLES OF FLAT-FOLDED BOXES OF CORRUGATED BOARD

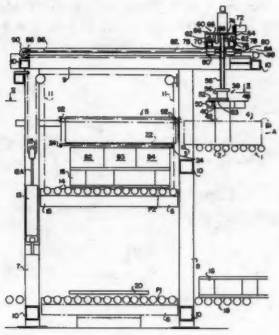
Henry Bon, Vaulx-en-Velin, France, assignor to The Langston Machine Company Limited, Bristol, Great Britain

Filed Apr. 20, 1988, Ser. No. 183,791

Claims priority, application United Kingdom, Apr. 25, 1987, 8709851

Int. Cl.[5] B65G *57/03*

U.S. Cl. 414—789.5 **8 Claims**



1. Apparatus for stacking bundles of flat-folded corrugated board, comprising means to feed the bundles in succession to a pick-up position, means to transfer the bundles one at a time from said pick-up position to a stacking position so as to create a number of layers forming a stack of bundles at the stacking position, each layer including a plurality of bundles, said transfer means including means for gripping bundles substantially by vertical surfaces thereof, support means at said stacking position to receive said bundles, means to lower said support means as the stack is built up, means for automatically inserting a horizontal divider sheet for frictionally tying together adjacent bundles contacting the divider sheet at at least one selected position between adjacent layers of bundles in the stack, and a programmable control means for automatically controlling the position and orientation at which each bundle is delivered onto the stack and for controlling the sheet insertion means so that the bundles form a predetermined pattern in the stack controlled by the control means, at least two layers having different bundle patterns determined automatically by the control means for substantially optimal stacking of the bundles, wherein the means for transferring bundles from the pick-up position to the stacking position comprises means for raising and lowering the gripping means, means for moving the gripping means horizontally in two directions, and means for rotating the gripping means about a vertical axis, all of said immediately previously recited movement-producing means being controlled by the control means.

4,984,964

PUMP FOR REFRIGERATION SYSTEMS, IN PARTICULAR FOR AERONAUTICAL APPLICATIONS

Antonio Callerio, and Vincenzo Callerio, both of Milan, Italy, assignors to F.I.M.A.C. Fabbrica Italiana Macchine Aria Compressa S.p.A., Senago, Italy

Filed Jun. 7, 1989, Ser. No. 362,791

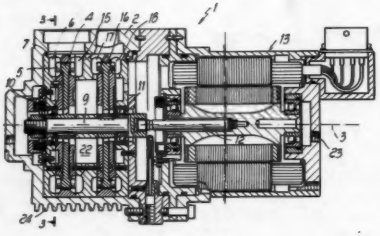
Claims priority, application Italy, Jun. 15, 1988, 20976 A/88

Int. Cl.[5] F04D *29/00*

U.S. Cl. 415—55.4 **7 Claims**

1. A pump for refrigerating systems, comprising a pump body defining a main axis, at least one substantially disk-shaped impeller being rotatably supported by said pump body and having at least one blade bearing face, said impeller being

rotatable about said main axis of said pump body, said at least one blade bearing face lying in a plane which is substantially perpendicular to said main axis, a plurality of radial blades being formed on said at least one blade bearing face and extending perpendicularly therefrom in a direction substantially parallel to said main axis, said plurality of radial blades being arranged along a circular ring concentric to said main axis, at least one annular duct extending in said pump body, said at least one annular duct extending concentrically to said main axis and being arranged such that said at least one blade bearing face of said at least one impeller delimits one side of said at least one annular duct, said plurality of radial blades extending into and being accommodated in said at least one annular duct, said at least one annular duct having an intake port and a



delivery port, said intake port allowing for fluid inflow into said at least one annular duct and said delivery port allowing for fluid outflow out of said at least one annular duct, each blade of said plurality of blades having a curved configuration, a concavity being defined by said curved configuration of said each blade, said concavity being directed along a rotation direction of said impeller, said at least one annular duct having a cross-section with a substantially elongated toroidal configuration with a base which is tangent to said at least one blade bearing face, whereby rotation of said at least one impeller causes fluid to advance along said at least one annular duct thereby forming vortices about a circumference formed by a middle line of said at least one annular duct from said intake port to said delivery port.

4,984,965

VARIABLE GEOMETRY TURBINE INLET WALL MOUNTING ASSEMBLY

Peter McKean, Marsh, United Kingdom, assignor to Holset Engineering Company Limited, United Kingdom

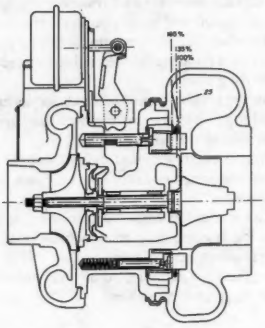
Filed May 15, 1989, Ser. No. 352,094

Claims priority, application United Kingdom, May 17, 1988, 8811621

Int. Cl.[5] F01B *25/02*; F01D *17/12*

U.S. Cl. 415—155 **4 Claims**

1. A mounting assembly for a movable annular wall member of an inlet passageway of a variable geometry turbine, wherein the inlet passageway is defined between the movable wall and a facing wall, the wall member is formed from a sheet material, and the wall member is supported on a plurality of pins which extend parallel to its direction of movement, characterised in that the wall member comprises a tubular portion extending away from the said facing wall, each pin supports a radially extending link, and each link is engaged in a respective slot in the tubular portion of the wall member, the links being a relatively close fit in the said direction of movement and a relatively loose fit in the circumferential direction.



4,984,966

METHOD OF MAKING LINER

Anthony Grzina, Artarmon, Australia, assignor to Warman International Limited, Australia

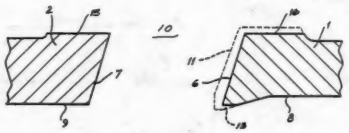
PCT No. PCT/AU88/00358, § 371 Date May 31, 1989, § 102(e) Date May 31, 1989, PCT Pub. No. WO89/02534, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 15, 1988, Ser. No. 353,664

Claims priority, application Australia, Sep. 15, 1987, PI4385

Int. Cl.[5] F04D *7/04, 29/42*

U.S. Cl. 29—888.061 **3 Claims**



1. A method of assembly a liner for a centrifugal slurry pump comprising;

(i) a throat bush having an inner surface and an outer surface;

(ii) a volute liner having an inner surface and an outer surface and two opposed openings, the volute liner having a wall thickening surrounding each opening on the inner surface of said volute liner; and

(iii) a frame plate liner insert having an inner surface and an outer surface;

said method comprising the steps of:

(A) inserting the throat bush into one of the openings of the liner into its assembled position, whereby the volute liner has the respective wall thickening projecting inwardly at the one opening beyond the inner surface of the throat bush;

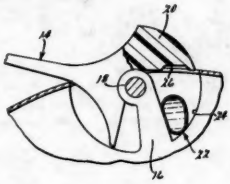
(B) reducing the inner surface of the volute liner adjacent the one opening until the inner surfaces of the volute liner and throat bush are substantially aligned around the one opening;

(C) inserting the frame plate liner insert into the other of the openings of the volute liner into its assembled position, whereby the volute liner has its respective wall thickening projecting inwardly at the other opening beyond the inner surface of the frame plate liner insert; and

(D) reducing the inner surface of the volute liner adjacent the other opening until the inner surfaces of the volute

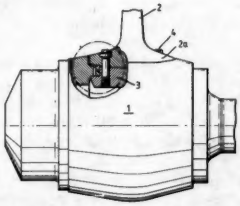
liner and frame plate liner insert are substantially aligned around the other opening.

4,984,967
PROPFAN BLADE ERECTION DAMPER
Gerald S. Cruzen, Brighton, Mich., assignor to Williams International Corporation, Walled Lake, Mich.
Filed Jul. 24, 1989, Ser. No. 383,628
Int. Cl.[5] B64C 27/51
U.S. Cl. 416—140 **2 Claims**



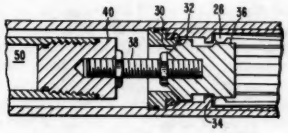
1. A blade erection damper for a folding propfan blade comprising
   a folding propfan blade journaled for rotation about an axis extending at substantially a right angle to said blade from a folded position to a run condition,
   a blade hammer on a root portion of said blade engageable with a blade support to position said blade in the run condition, and
   a frangible element disposed between said blade hammer and said blade support when said blade is in the folded condition and engageable by said blade hammer to dampen erection of said blade.

4,984,968
VARIABLE PITCH PROPELLERS
Bernard H. M. Laverion, Soevik, Norway, assignor to Ulstein Propeller A/S, Norway
Filed Nov. 3, 1989, Ser. No. 431,090
Int. Cl.[5] A47C 7/74
U.S. Cl. 416—146 A **2 Claims**



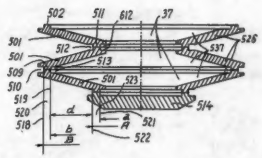
1. An improvement in variable propellers having a propeller hub (1) and a number of turnable propeller blades (2) which are each removably attached to a rotatable crank disk (3), said improvement comprising, for each propeller blade (2), a first seal (5) between the hub (1) and a respective propeller blade root (2a), a second seal (6) between the hub (1) and the crank disk (3) and a by-pass valve (7) passing the second seal (6).

4,984,969
PLUNGER LIFT TOOL
Douglas H. Fineberg, Bowie, Md., assignor to Eastport International, Upper Marlboro, Md.
Filed Sep. 8, 1989, Ser. No. 404,405
Int. Cl.[5] F04B 47/12
U.S. Cl. 417—58 **10 Claims**



1. A plunger lift tool for lifting fluid from wells, comprising:
   a tubular member having a nose assembly for admitting well fluids disposed at a lower end thereof;
   a valve assembly located in said tubular member above said nose assembly for stopping the flow of said well fluids through the plunger lift tool when a predetermined hydrostatic pressure is reached;
   said valve assembly comprising a slidable valve means, means for gripping said slidable valve means, and a valve seat fixed in said tubular casing;
   a piston means operatively connected to and located above said valve assembly;
   said piston means having a smaller diameter than said tubular member, thereby allowing fluid the flow between the piston means and the tubular member; and
   a pressure relieving means connected to said piston means and extending beyond the upper end of the cylindrical member;
   said means for gripping comprising a radially expandable fingered collet member fixed within said tubular member and having protruding grippers disposed at the upper end of each of said fingers;
   said slidable valve means having an angled sealing portion, a protruding retaining portion and a shoulder portion;
   said protruding grippers being adapted to grip said protruding retaining portion.

4,984,970
ARRANGEMENTS ON CONED RINGS WHICH ARE APPLICABLE IN HIGH PRESSURE PUMPS AND RELATED DEVICES
Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan
Continuation-in-part of Ser. No. 926,921, Oct. 22, 1986, abandoned. This application Apr. 3, 1989, Ser. No. 332,319
Int. Cl.[5] F04B 43/02
U.S. Cl. 417—271 **21 Claims**



1. An arrangement of a coned disc for a valved pumping chamber to form radially inside of the coned portion of said coned disc inner chamber which is filled with a fluid while a fluid pressure supply means in provided to supply fluid under pressure into an outer chamber which surrounds at least a portion of said coned disc to compress periodically said coned disc is axial direction to periodically increase and decrease the

volume of said inner chamber inside of said coned disc, and an improvement, wherein the improvement exists in the provision of supply and control means for the periodic increase and decrease of the pressure and volume in said outer chamber, and wherein said improvement further includes the provision of a radially defined sealing area between inner- and outer- diameters of said sealing area with said sealing area provided on the radial outer or inner portion of said coned disc with the radial distance between said diameters shorter than one half of the radial length of the coned portion of said coned disc, to secure that said coned disc remains with said sealing area pressed against an adjacent and complementary face, even if equal pressures are provided in both of said chambers and thereby on both axial ends of said coned portion of said coned disc because the pressurized areas of said coned portion of said coned disc differ by said sealing area.

4,984,971

ANTI-VIBRATORY DEVICE TO ATTACH A HERMETIC COMPRESSER CHAMBER TO ITS BASE

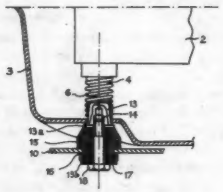
Emile Bergeron, La Verpilliere, France, assignor to L'Unite Hermetique, La Verpilliere, France

Filed Dec. 1, 1981, Ser. No. 326,204

The portion of the term of this patent subsequent to Jun. 15, 2003, has been disclaimed.

Int. Cl.[5] F04B *39/12;* **F16M** *7/00*

U.S. Cl. 417—363 **6 Claims**



1. An anti-vibratory device for attaching a hermetic compressor chamber with an assembly therein to a base comprising:

at least one stud adapted to extend through said chamber from the underside and to be fixed thereto, the underside of each said stud having a threaded recessed hole accessible from outside said chamber;

a spring mounted between each stud and said assembly for coupling said assembly to said chamber;

a block of elastic material between each said stud and said base; and

a screw extending into said recessed hole for fixing said block to said stud.

4,984,972

CENTRIFUGAL BLOOD PUMP

Earl W. Clausen, Eden Prairie, and Lloyd C. Hubbard, Deephaven, both of Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Oct. 24, 1989, Ser. No. 426,102

Int. Cl.[5] F04D *7/02, 25/06*

U.S. Cl. 417—420 **45 Claims**

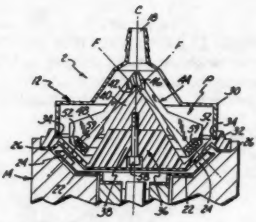
1. A disposable pumping unit adapted to pump biological fluid such as blood, the pumping unit comprising:

a pump housing having a pumping chamber therein, and having an inlet and an outlet communicating with the pumping chamber;

a stator having a proximal end and a distal end with the proximal end connected to the pump housing and the distal end extending into the pumping chamber, the stator defining a central axis;

a bearing supported at the distal end of the stator and aligned with the central axis;

a rotator positioned within the pumping chamber and supported on the bearing for rotation about the central axis,



the rotator having a hub and a plurality of openings configured to expose the bearing to the fluid; and

magnetic means carried by the rotator within the pumping chamber.

4,984,973

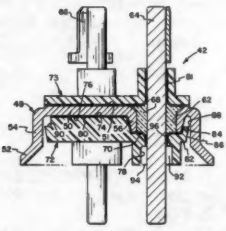
HERMETIC MOTOR COMPRESSOR UNIT HAVING A HERMETIC TERMINAL WITH ELECTRICALLY INSULATING ANTI-TRACKING CAP

Terry Itameri-Kinter, North Attleboro, and David W. Sauerbrey, Somerset, both of Mass., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Mar. 21, 1990, Ser. No. 497,085

Int. Cl.[5] F04B *35/04;* **H01R** *13/533;* **H01B** *17/30*

U.S. Cl. 417—422 **20 Claims**



1. In a hermetic motor compressor unit having a housing with an opening therein, a hermetic terminal mounted in the housing opening and adapted for carrying electric current from the exterior of the housing to the interior thereof, comprising:

a metallic cup-shaped body member including an open end facing the interior of the housing, a closed end having an inner surface facing the interior of the housing, and a generally cylindrical sidewall therebetween, said closed end having a plurality of openings providing communication therethrough;

a plurality of current-conducting pins corresponding to said plurality of openings in said body member, each pin being received within and extending through a respective opening;

an electrically insulating cap member having a bottom surface, a radially outer peripheral edge, and a plurality of apertures therein corresponding to said plurality of current-conducting pins, said bottom surface of said cap member being secured to said inner surface of said closed end with each of said apertures surrounding a respective one of said pins, said cap member defining an oversurface

distance between said metallic body member and each of said current-conducting pins; and

means for protecting a portion of said oversurface distance from contaminants within said housing, said means including a substantially uniform gap defined by said outer peripheral edge of said cap member and said sidewall of said body member, whereby said gap inhibits the deposit of contaminants on said protected portion of said oversurface distance.

4,984,974

SCREW TYPE VACUUM PUMP WITH INTRODUCED INERT GAS

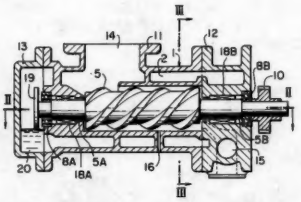
Koutarou Naya; Kazuaki Shiinoki, both of Shimizu; Tadashi Hayakawa, Kamakura; Kiyoshi Masujima, Chigasaki; Riichi Uchida, Ibaraki, and Katsumi Matsubara, Ushiku, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,740

Claims priority, application Japan, Dec. 18, 1987, 62-318880

Int. Cl.[5] F04C *18/16, 25/02, 27/00;* F16J *15/447*

U.S. Cl. 418—87 **8 Claims**



1. A screw type vacuum pump comprising:

a pump casing having a working chamber means, a suction inlet and a discharge outlet;

a pair of rotors incorporated within said working chamber means of said pump casing and rotatively carried at opposite ends thereof, said rotors meshing with each other to rotate in a synchronized manner;

first bearing means provided in a portion of said pump casing associated with said suction inlet for carrying said rotor;

second bearing means provided in a portion of said pump casing associated with said discharge outlet;

sealing means disposed in said pump casing and respectively associated with said first and second bearing means; and

means provided in said pump casing for introducing inert gas into said working chamber means towards at least the sealing means associated with the second bearing means thereby preventing a deposition of a process gas handled by the vacuum pump from accumulating on components of the vacuum pump.

4,984,975

ROTARY PUMP WITH CUTTING MEANS

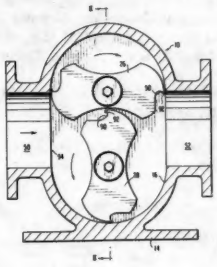
George A. Thompson, 114 Demotte Ave., Daytona Beach, Fla. 32019

Filed Jan. 26, 1989, Ser. No. 301,786

Int. Cl.[5] F04C *13/00*

U.S. Cl. 418—181 **3 Claims**

1. A rotary pump comprising housing means having a pumping chamber in communication with an inlet passage and an outlet passage opposite said inlet passage, a pair of parallel spaced apart drive shafts extending into said casing orthogonal to a line extending through said inlet passage and outlet passage, a pair of identical double-lobed rotors secured to said shafts for rotation therewith in intermeshing engagement for pumping liquid and cutting means on each lobe of each rotor extending parallel to said shafts for comminuting solid or stringy material entrained in said liquid as said cutting means



passes an edge of said housing between said inlet passage and said chamber.

4,984,976

MOLD FOR MAKING ANNULAR POLYMERIC ARTICLES

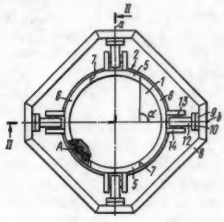
Gennady G. Kozachevsky, ul. Yakubovskogo, 18, k. 2, kv. 271; Vladimir P. Boikov, ul. Ya. Kolasa, 139, kv. 172; Valery V. Guskov, ulitsa Kulman, 13, kv. 19; Oleg I. Molodan, ulitsa Slavinskogo, 15, kv. 63; Svetlana I. Sizova, ulitsa Ya. Kolasa, 139, kv. 172, all of Minsk, and Jury N. Gorodnichev, ulitsa Gertsena, 37, korpus 1, kv. 72, Moscow, all of U.S.S.R.

PCT No. PCT/SU86/00018, § 371 Date Oct. 26, 1987, § 102(e) Date Oct. 26, 1987, PCT Pub. No. WO87/05257, PCT Pub. Date Sep. 11, 1987

PCT Filed Feb. 27, 1986, Ser. No. 134,778

Int. Cl.[5] B29C *35/02, 33/26;* B29D *29/08*

U.S. Cl. 425—35 **4 Claims**



1. A mould for making annular polymeric articles comprising a cylindrical core (1) having a shaped surface mounted on a base and arranged to accommodate a workpiece (A) thereon, annular squeezing means (5, 6) for squeezing the workpiece arranged around the cylindrical core (1), means for moving said squeezing means radially to the formation of a closed circuit, and kinematic linkage for linking the means for moving with said squeezing means, said squeezing means comprising first and second elements (5, 6) arranged around the cylindrical core (1) for movement along directions which are orthogonal to each other, each first element (5) having side surfaces parallel with an axis (a) of symmetry of this element (5), whereas each second element (6) has side surfaces adjacent to the side surfaces of the neighboring first elements (5), the kinematic linkage linking the first and second elements (5 and 6) with the means for moving and being arranged to enable successive movement initially of all the second elements (6) radially inwardly and then all the first elements (5) radially inwardly by the moving means to form the closed circuit.

4,984,977

SCREW-TYPE EXTRUDER HAVING A STARTING VALVE AND THROTTLE

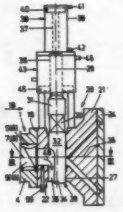
Albert Grimminger; Wolfgang Lauser, both of Leonberg; Franz J. Müller, Bietigheim-Bissingen; Gerhard Pfaff, and Edgar Schlipf, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Werner & Pfleiderer, GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 21, 1989, Ser. No. 341,566

Claims priority, application Fed. Rep. of Germany, May 10, 1988, 3815897

Int. Cl.[5] B29C *47/10, 47/92*

U.S. Cl. 425—145 6 Claims



1. A screw-type extruder comprising:

a housing (1) which is provided with at least one bore (5,6) having a first end and a second end, with a hopper (15) for receiving material and opening into said at least one bore at said first end and with a delivery channel (23) at said second end;

at least one screw (9, 10) which is rotatably arranged in said at least one bore (5, 6) of the housing (1) and which conveys said material while melting or plasticising into a conveying direction (18) from said hopper (15) to said delivery channel (23);

a starting valve for channeling said material out of said housing during a starting operation of the extruder and a throttle valve for generating a back pressure on the molten or plasticized material, the starting valve and the throttle valve comprising:

a valve-throttle housing (21) having a guiding and starting bore (27), said guiding and starting bore has a starting outlet opening and passes through said delivery channel (23) and said delivery channel (23) leads into said guiding and starting bore (27) with an inlet opening and leads out of said guiding and starting bore (27) with an outlet opening and passes in a straight line through said guiding and starting bore (27);

a starting valve and throttle body (28) which has a longitudinal axis (29) and which is arranged in said guiding and starting bore (27) so as to be displaceable at right angles to the conveying direction (18) in the direction of the longitudinal axis (29) between a first end position and a second end position of displacement, the first end position being a starting position and the second end position being a throttling position; and

wherein the starting valve and throttle body (28) has two closing bodies (31, 32) and a throttle body (33), which is arranged between said two closing bodies (31, 32) and a starting valve body (34), which is arranged on one of said two closing bodies (32) remote from the throttle body (33), and

wherein in said first end position of said starting valve and throttle body (28) said starting valve body (34) connects said inlet opening of the delivery channel (23) to the said starting outlet opening (35) whereby said outlet opening of said delivery channel (23) is closed, and

wherein in said second end position of said starting valve and throttle body (28) said throttle body (33) connects said inlet opening to said outlet opening of said delivery channel (23), whereby said one closing body (32) on which the starting valve body (34) is arranged closes said starting outlet opening (35), and

wherein the throttle body (33) is in the form of a vane-type throttle having at least one throttling surface (52, 53) which, together with at least one associated throttling channel bounding surface (54, 55) defines at least one throttling channel (56, 57) the length (l) of which is variable by pivoting the throttle body (33) about said longitudinal axis (29) to vary said back pressure on the molten or plasticized material.

4,984,978

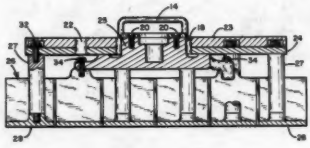
DIVIDER HEAD ASSEMBLY

David E. Beatty, Wrenshall, Minn., assignor to Dutchess Bakers' Machinery Co. Inc., Superior, Wis.

Continuation-in-part of Ser. No. 217,657, Jul. 12, 1988, Pat. No. 4,898,528, and a continuation-in-part of Ser. No. 345,565, May 1, 1989, Pat. No. 4,950,147. This application Jan. 30, 1990, Ser. No. 472,580

Int. Cl.[5] A21C *3/10, 5/08*

U.S. Cl. 425—185 6 Claims



1. A divider head assembly for detachable mounting to a dividing and rounding machine, comprising

(a) a cover plate having an upper surface with means for attachment to said dividing and rounding machine, said cover plate having a central aperture therethrough, and having a plurality of further apertures therethrough; said cover plate having a lower surface;

(b) a plug plate having an upper surface closely affixed against said cover plate lower surface, said plug plate having a central aperture therethrough and a plurality of further apertures therethrough, all respectively aligned with said cover plate central aperture and further apertures, and having a lower surface with means for attachment to a plurality of plugs;

(c) a cutter blade holder having a neck sized to loosely fit through said two central apertures, said neck having means for attachment to said dividing and rounding machine above the upper surface of said cover plate; said cutter blade holder having a plurality of cutter blade mounting fasteners beneath the lower surface of said plug plate, each of said mounting fasteners being alignable with a respective one of said plurality of further apertures through said cover plate and said plug plate;

(d) a cutter blade assembly detachably connected to said cutter blade holder by said plurality of mounting fasteners, said cutter blade assembly further comprising a geometric arrangement of blades, said blades being welded together along interconnecting edges to form a unitary assembly, wherein said mounting fasteners are accessed to remove said cutter blade assembly upon alignment of said fasteners and said plurality of further apertures; and

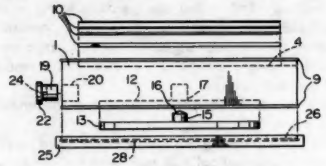
(e) a plurality of plugs, each plug having a geometric shape to slidably fit between and within said geometric arrangement of blades, and each plug connected to said plug plate lower surface with means for attachment to plugs.

4,984,979

DOUGH LEVELLER/TURNTABLE DEVICE

Beverley A. Hari, Box 6028, Station A, Calgary, Alberta T2H 2L3, Canada

Filed Oct. 16, 1989, Ser. No. 409,404
Int. Cl.[5] B29C *43/02*; A21C *3/02*
U.S. Cl. 425—374 8 Claims



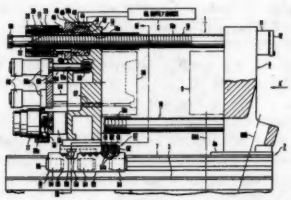
1. A dough working device comprising body means; first recess means in a top surface of said body means for receiving material to be rolled, second recess means in a bottom surface of said body means, turntable means normally carried by said second recess means in a stored position; and plug means for insertion into said second recess means for rotatably supporting said turntable means in a use position when the body means is inverted.

4,984,980

MOLD CLAMPING APPARATUS FOR MOLDING MACHINE

Toyoaki Ueno, Yamaguchi, Japan, assignor to UBE Industries, Ltd., Ube, Japan

Filed Jan. 29, 1990, Ser. No. 471,948
Claims priority, application Japan, Jan. 30, 1989, 1-20051
Int. Cl.[5] B29C *45/67, 45/68*
U.S. Cl. 425—595 8 Claims



1. A mold clamping apparatus for a molding machine, comprising:

a stationary platen arranged on a frame and mounting a stationary metal mold for the molding machine;

a movable platen arranged to oppose said stationary platen to move forward/backward with respect to said stationary platen and mounting a movable metal mold;

a driving device for moving said movable platen forward-/backward with respect to said stationary platen;

a rotational-linear motion transmission mechanism, arranged between said driving device and said movable platen, for converting a rotational torque of said driving device into a linear motion in a moving direction of said movable platen;

a braking device, connected to said driving device, for braking a linear motion of said movable platen toward said stationary platen at the end of the linear motion; and

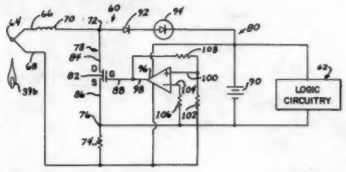
a mold clamping force applying mechanism for applying a mold clamping force to said movable platen upon braking of said braking device.

4,984,981

HEATER WITH FLAME POWERED LOGIC SUPPLY CIRCUIT

Joseph R. Pottebaum, Brookfield, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Jun. 2, 1989, Ser. No. 360,271
Int. Cl.[5] F23N *5/10*
U.S. Cl. 431—80 20 Claims



1. In a heater assembly having a main burner intermittently ignited by a pilot flame, a flame powered logic supply circuit responsive to said pilot flame and supplying electrical energy to power electronic logic circuitry for the heater assembly, said supply circuit comprising a thermoelectric element responsive to said pilot flame and outputting electrical current, a first electrical energy storage component coupled to said thermoelectric element, a pair of parallel circuit branches coupled to said thermoelectric element and said storage component such that current flow through the first of said branches supplies current from said thermoelectric element to said storage component to supply energy thereto, the second of said circuit branches having a second energy storage component of a given power rating for powering said electronic logic circuitry of said heater assembly, one of said branches having a semiconductor switch with on and off states, monitoring circuitry monitoring the energy stored in said first storage component and controlling said semiconductor switch between said on and off states in response thereto, such that during one of said states current flows through said first branch including from said thermoelectric element to said first storage component to supply energy thereto, and such that during the other of said states current flows through said second circuit branch including from said first storage component to said second storage component to supply stored energy from said first storage component to said second storage component to maintain said given power rating of the latter.

4,984,982

RETRACTABLE ACCESS FLOORING MODULE

Alan W. Brownlie, Skaneateles, N.Y., and Jack W. Lawhead, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 28, 1989, Ser. No. 387,560
Int. Cl.[5] H01R *13/46*
U.S. Cl. 439—131 23 Claims

15. An electrical assembly having electrical sockets provided therein, the electrical assembly comprising:

an inner assembly having a first sidewall, a second sidewall, and endwalls;

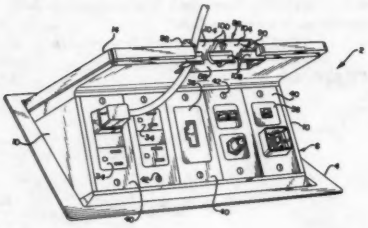
an outer frame means having a front wall which is spaced from the first sidewall of the inner assembly;

pivot means provided between the inner assembly and the outer frame means, the pivot means provided to allow the inner assembly to move between a first position and a second position relative to the outer frame means;

a deformable member provided proximate to and integrally attached to the first sidewall of the inner assembly;

whereby as the inner assembly is moved between the first and the second positions, the deformable member will engage the front wall of the outer assembly, causing the deformable member to frictionally engage the front wall

in such a manner so as to insure that the motion of the inner assembly between the first and the second position



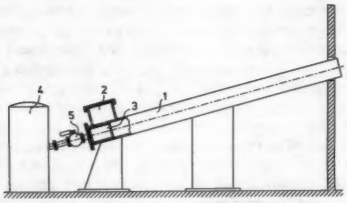
will be done in a controlled manner which will not damage the electrical sockets provided in the assembly.

4,984,983

METHOD OF COFIRING HAZARDOUS WASTE IN INDUSTRIAL ROTARY KILNS

Torben Enkegaard, Valby, Denmark, assignor to F. L. Smidth & Co. A/S, Denmark

Filed Feb. 7, 1989, Ser. No. 307,631
Int. Cl.[5] F27B *15/00*
U.S. Cl. 432—14 13 Claims



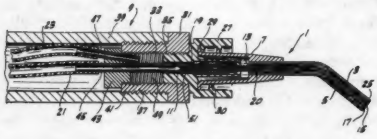
1. A method of destroying hazardous organic waste material in solid, pasty, greasy or sludge form including the steps of maintaining a burning zone in a rotary kiln at a gas temperature of at least 1500° C., introducing the waste directly into the burning zone, simultaneously burning the waste together with cement, lime or lightweight aggregate in the kiln so as to form a gaseous combustion product and an environmentally acceptable clinker product, maintaining the gaseous combustion product at a temperature of at least 1200° C. for a period of at least two seconds, and removing the clinker product from the kiln.

4,984,984

DENTAL TOOL AND NOZZLE THEREFOR

Bernard S. Esrock, 320 Dungate, Chesterfield, Mo. 63017

Filed Jul. 18, 1988, Ser. No. 221,028
Int. Cl.[5] A61C *3/02*
U.S. Cl. 433—88 17 Claims



1. A removable nozzle for the simultaneous discharge of first and second fluids through a distal end of the nozzle and for attachment to the hand piece of a dental tool comprising sources of the first and second fluids, the nozzle comprising:

first and second conduits having coaxial intake ports for fluid communication with the sources of the first and second fluids and coaxial discharge ports at the distal end of the nozzle for discharging the first and second fluids, the first conduit being contained at least partially within the second conduit and the conduits being bent to constrain the first conduit in the second conduit without bonding the conduits together, the discharge ports of the conduits being proximately located with respect to one another, and

coupling means for releasably coupling the nozzle to the hand piece,

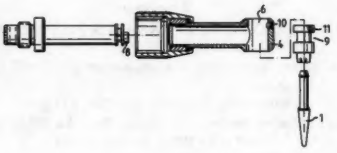
wherein upon coupling the nozzle to the hand piece the first conduit is automatically aligned with and connected to the source of the first fluid to enable quick connection and disconnection of the nozzle to the hand piece.

4,984,985

DENTAL INSTRUMENT

Svante R. Edwardson, Solna, Sweden, assignor to Dentatus International AB, Hagersten, Sweden

Filed Sep. 26, 1988, Ser. No. 251,957
Int. Cl.[5] A61C *1/07*
U.S. Cl. 433—123 17 Claims



1. A dental instrument for peeling away an outer layer of tooth surface layer including:

(a) a tool support,

(b) a tool having a tip with a rough surface and having sufficient rigidity to peel away a thin layer of tooth surface,

(c) rotational drive means,

(d) means in continuous engagement with said rotational drive means transforming its rotary movement into alternating movement forces in the direction of the axis of said tool support,

(e) means for preventing said tool support from rotating, and

(f) means for holding said tool in said tool support in a chosen angular position in relation to said tool support,

wherein said means for holding said tool in said tool support is able to hold said tool in an angular position chosen among a limited number of predetermined positions, and

wherein said holding means includes at least one nib at the base of a rotational symmetric shaft of said tool to be inserted into said support and a number of recesses around the entrance end of said support adapted to accommodate said at least one nib when said tool is inserted.

4,984,986

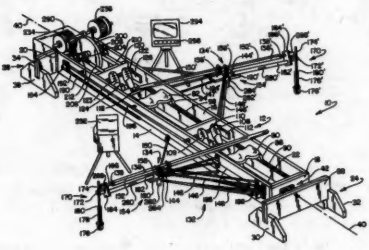
APPARATUS AND METHOD FOR TRAINING OARSMEN

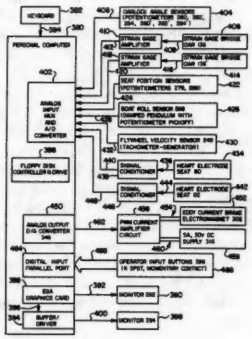
Vincent J. Vohnout, 3448 Trabue Rd., Columbus, Ohio 43204

Filed Nov. 7, 1989, Ser. No. 432,595
Int. Cl.[5] A63B *69/00*; G09B *9/06*
U.S. Cl. 434—247 28 Claims

1. Apparatus for training oarsmen to row a racing shell operationally exhibiting give mass and hydrodynamic drag terms, comprising:

a racing shell simulative housing having a longitudinal roll axis and a given boat plane;
an oarsman seat mounted upon said housing;
an oarlock supported from said housing;
a simulated oar extending along an oar axis and pivotally mounted with a oarlock;
a rotatable mass mounted for rotation with respect to said housing for simulating said mass term;
a drive linkage coupled in driven relationship with said oar and in driving relationship with a rotatable mass;
drag means for imposing a select drag upon said rotatable mass simulative of said hydrodynamic drag term;
a sweep angle transducer responsive to the sweep angle of said oar for providing a sweep angle output;
a force transducer responsive to the forces transmitted by an oarsman through said oar while positioned upon said seat for providing a force output;





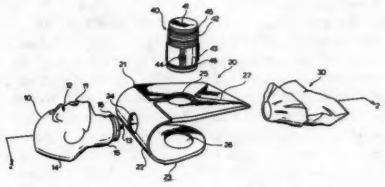
control means responsive to said sweep angle output and said force output for deriving a power stroke output representing values of said force exerted from said oar with respect to sweep angle; and
readout means responsive to said power stroke output for providing a perceptible readout representative thereof.

27. Apparatus for training oarsmen to row a racing shell operationally exhibiting given mass and hydrodynamic drag terms, comprising:
a racing shell simulative housing having a longitudinal roll axis and a given boat plane;
an oarsman seat mounted upon said housing;
an oarlock supported from said housing;
a simulated oar extending along an axis and pivotally mounted with said oarlock;
a rotatable mass mounted for rotation with respect to said housing for simulating a mass term;
a drive linkage coupled in driven relaitonship with said oar and in driving relationship with said rotatable mass;
drag means for imposing a select drag upon said rotatable mass simulative of a hydrodynamic drag term; and
a blade flotation simulator responsive to movement of said oar and simulating the flotation of an oar blade in water.

4,984,987
CPR MANIKIN

Richard Brault; Dianne Croteau, both of Toronto, and Jonathan Vinden, Mississauga, all of Canada, assignors to Actar Airforce, Inc., Toronto, Canada

Filed Nov. 9, 1989, Ser. No. 433,904
Int. Cl.[5] G09B *23/28*
U.S. Cl. 434—265 **21 Claims**

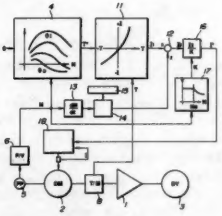


1. A CPR manikin comprising in combination:
a head means having a mouth opening and a throat means in communication with the mouth opening;
a disposable lung means adapted to be fastened over and to be in communication with the throat means;
a chest means including a sheet of flexible material forming a front plate having a thickness much less than its width and length;
a resilient compression means fastened to and under the front plate of said chest means, to provide a biasing force on said front plate; and
means defining an opening in said front plate extending through said front plate, said resilient compression means having a portion thereof disposed in said opening.

4,984,988
SIMULATED ENGINE CHARACTERISTIC CONTROL SYSTEM

Fumio Mizushina; Takashi Goto, and Toshimitsu Maruki, all of Shizuoka, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Nov. 13, 1989, Ser. No. 436,298
Int. Cl.[5] G09B *25/00*
U.S. Cl. 434—380 **8 Claims**



1. A simulated engine characteristic control system for power train performance tests of an automotive vehicle comprising:

a motor simulated engine of an automotive vehicle having a rotating member for driving an input shaft of a power train for said automotive vehicle;

means for monitoring revolution of said motor, said monitoring means generating a signal indicative of the revolution of said motor;

means for simulating an opening angle of a throttle valve of an engine or an intake manifold pressure of an engine, said simulating means generating a signal indicative of an opening angle or an intake manifold pressure;

an engine characteristic generator for generating a torque command signal according to predetermined engine revolution and torque characteristic curves memorized therein, in response to the signals from both said monitoring means and said simulating means;

means for transducing said torque command signal to an electric current command signal according to a predetermined torque and current characteristic curve of said motor memorized therein;

first compensating means for compensating said current command signal by a compensatory current signal corresponding to a torque component occurring at an axial moment of inertia of the rotating member of said motor during acceleration and deceleration of said motor;

second compenssating means for compensating a first compensated current command signal from said first compensating means according to a field characteristic of a field coil of said motor, said field characteristic representing the output torque and revolution speed of said motor; and

means for controlling said motor in response to a final compensated current command signal from said second compensating means.

4,984,989

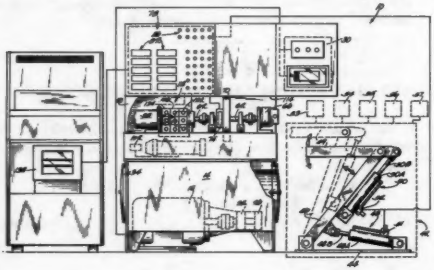
FLUID POWER DEMONSTRATION FACILITY

Rick Ottman, Milwaukee; Don Wiberg, Brookfield; Jack Johnson, Milwaukee; Thomas S. Wanke, Menomonee Falls, and Thomas W. Davis, Grafton, all of Wis., assignors to Milwaukee School of Engineering, Milwaukee, Wis.

Filed Sep. 7, 1989, Ser. No. 404,338

Int. Cl.[5] G09B *25/00*

U.S. Cl. 434—401 **53 Claims**



1. A fluid power demonstration facility comprising means defining a fluid power source, directing means connected in fluid communication with said fluid power source for selectively supplying fluid power from said fluid power source, pre-arranged rotary means selectively plumbed with said directing means for selective operation by said directing means and for demonstrating rotational motion produced in response to fluid power, said rotary means including a motor which comprises an elongate, rotatable shaft and which is adapted to be powered by said fluid power source, said demonstration facility further comprising means defining a selectively engageable inertial load on said shaft for selectively affecting dynamic response time of said rotary means, said selectively engageable means comprising a flywheel on said shaft and an electrically operable clutch selectively coupling said flywheel to said shaft for common rotation of said flywheel and said shaft, and said demonstration facility further comprising pre-arranged linear means in plumbed connection with said directing means, and selectively operable by said directing means, for demonstrating linear motion produced in response to fluid power.

4,984,990

CONNECTION PLUG FOR A MICROWAVE UNIT

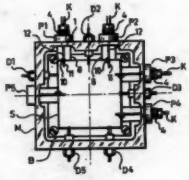
Per A. A. Lindahl, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jun. 13, 1989, Ser. No. 365,435

Claims priority, application Sweden, Jun. 16, 1988, 8802263

Int. Cl.[5] H05K *1/00*

U.S. Cl. 439—63 **3 Claims**



1. A coaxial conductor-to-stripline conductor connection plug for connecting a microwave unit stripline conductor on a substrate plate of a microwave unit to a coaxial conductor, comprising:

a hollow body part including a central cavity for receiving a coaxial conductor;

a flange part integral with said hollow body part;

a conductor element enclosed within said flange part, said conductor element including a central conductor which projects out from either side of said flange part, a first end of said central conductor for connection with the coaxial conductor;

a projecting part integral with and projecting from said flange part, said projecting part being formed as a half cylinder, a longitudinal planar surface of said half cylinder forming a flat surface and a transverse planar surface of said half cylinder for abutting a base plate of the microwave unit and thereby helping to hold said connection plug in a fixed position relative to the base plate;

a substrate piece mounted on said flat surface; and

a plug stripline conductor mounted on said substrate piece for connection with the microwave unit stripline conductor, a second end of said central conductor being in contact with and electrically connected to said plug stripline conductor.

4,984,991

IC SOCKET

Masato Nishimoto, Yokohama, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1990, Ser. No. 496,208

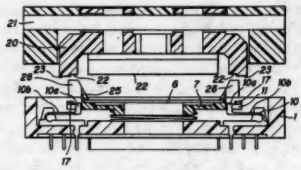
Claims priority, application Japan, Mar. 22, 1989, 1-70960

Int. Cl.[5] H05K *1/00*

U.S. Cl. 439—72 **2 Claims**

1. An IC socket comprising a socket board having a plurality of contacts for contacting IC leads and an IC accommodating portion formed in a central portion thereof, and an IC supporting platform adapted to support an IC package thereon and disposed in said acccommodating portion in such a manner as to be able to move upward and downward, said contacts being formed in parallel relation along opposing sides of said supporting platform, a plurality of grooves for positioning said contacts being formed in a parallel relation in opposing sides of said IC supporting platform, contacting portions of resilient contacting pieces of said contacts being received in said posi-

tioning grooves, said resilient contacting pieces being regulated by partition walls defining said positioning grooves, said IC socket being characterized in that among partition wall groups formed on four sides, one portion pf partition wall



groups of at least two opposite sides are interconnected at free ends of said partition walls, said connecting portions functioning as pressing portions for moving said IC supporting platform downward, other partition walls being left in a non-interconnected state.

4,984,992

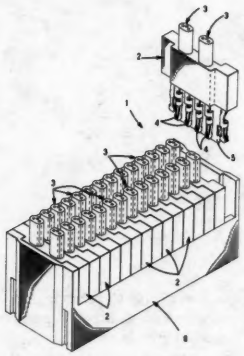
CABLE CONNECTOR WITH A LOW INDUCTANCE PATH

Robert E. Beamenderfer, Palmyra; Raymond R. Buchheister, Jr., Fairfield; John R. Ellis, Harrisburg; Charles A. Miller, York New Salem; Stanford C. Moist, Jr., Hummelstown, and William E. Zelko, Dauphin, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 1, 1989, Ser. No. 430,701

Int. Cl.[5] H01R *13/648*

U.S. Cl. 439—108 **21 Claims**



1. A cable connector, comprising, a housing block, an electrical cable having at least one signal wire connected to a corresponding signal contact on the housing block,

at least one reference wire of the cable for connection to a reference electrical potential, wherein the improvement comprises:

a reference conductor extending beside the signal contact and having a front that projects forward at least as far as a front of the signal contact,

means connecting the reference conductor to the reference wire,

an insulative housing coupled to the housing block,

the front of the signal contact being received in one of multiple contact positions in the housing,

the front of the reference conductor being received in the housing and extending beside each of the multiple contact positions,

a reference contact being received in the housing and being connected to a portion of the reference conductor positioned in the housing externally of a coupling span between the front of the signal contact and the front of the reference conductor.

4,984,993

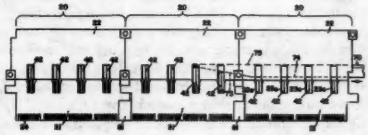
TWO-PIECE EDGE ZIF CONNECTOR WITH SLIDING BLOCK

Eugene F. Neumann; Melvin C. August, and Stephen A. Bowen, all of Chippewa Falls, Wis., assignors to Cray Research, Inc., Chippewa Falls, Wis.

Filed May 12, 1989, Ser. No. 351,871

Int. Cl.[5] H01R *13/629*

U.S. Cl. 439—157 **19 Claims**



1. An electrical connector, of the zero insertion force type, comprising:

(a) a first housing and a second housing, said first and second housings generally aligned side by side and said second housing having end walls defining guide holes;

(b) a first connector cooperatively mounted in said first housing and a second connector slideably mounted in said second housing, wherein said first and second connectors form an electrical path when mated with one another and wherein said second connector has a channel formed the interior of whereby when an insertion bar is selectively inserted through said guide holes and said channel, then said second connector cooperatively engages with or disconnect from said first connector.

4,984,994

CARD CONNECTOR

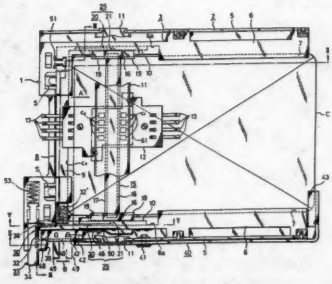
Akira Yamamoto, Yamatotakada, Japan, assignor to Hosiden Electronics Co., Ltd., Yao, Japan

Filed Nov. 14, 1989, Ser. No. 435,971

Claims priority, application Japan, Dec. 9, 1988, 63-160535[U]

Int. Cl.[5] H01R *11/22*

U.S. Cl. 439—267 **5 Claims**



1. In a card connector in which a housing houses a slider normally biased in an advancing direction by a spring load, the slider being pushed to a retracted position against the spring load by a card inserted into the housing, and being positioned at the retracted position by a lock mechanism,

said card connector comprising:

said slider having an engagement portion with which the tip of a card inserted into said housing is adapted to engaged, and a pair of left- and right-hand arms for transversely positioning the card, said slider being formed in a U-shaped in plan elevation;

a support member extending between both lateral sides of said housing;

contact pieces held by said housing through said supporting member and having contacts;

a movable member disposed between said arms of said slider, and movable between a first position where said contact pieces are deformed against the resiliency thereof, causing said contacts to be separated from a card setting position, and a second position where said movable member is separated from said contact pieces, permitting said contacts to project into the card setting position;

cam mechanisms for connecting said arms of said slider to said movable member and for moving said movable member between said first position and said second position in association with the longitudinal movement of each slider;

a communication enabling switch for turning ON/OFF a signal communication between apparatus connected to said card connector and a card inserted thereinto;

a switching member longitudinally slidably disposed at a lateral side of the housing, and having an edge adapted to be inserted into the contacts of said communication enabling switch to open the same when said switching member is located in a forward position;

a guide groove formed in said switching member and inclined upward in the forward direction; and

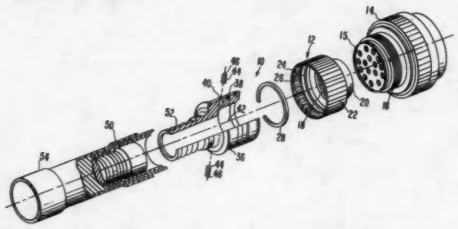
a swing member swingingly supported on a lateral side of said housing, and provided at one end thereof with a pin adapted to be engaged with said guide groove of said switching member and at the other end thereof with a stopper, said stopper being adapted to face a card inserting and removing port when said pin is engaged with said guide groove at the front side thereof due to the forward sliding of said switching member, and adapted to be separated from said card inserting and removing port when said pin is engaged with said guide groove at the rear side thereof.

4,984,995

ANTI-DECOUPLING DEVICE FOR ELECTRICAL CONDUIT CONNECTOR

Willy L. Tucker, and Katherine M. Arcoleo, both of San Jose, Calif., assignors to Icore International, Inc., Sunnyvale, Calif.

Filed Nov. 13, 1989, Ser. No. 434,199
Int. Cl.[5] H01R *13/639*
U.S. Cl. 439—321 **2 Claims**



1. An anti-decoupling unit for coupling a flexible electrical conduit to a connector having a threaded part, comprising:

a nut adapted to be threaded onto the threaded part of the connector, said nut having an inner periphery provided with a plurality of spaced recesses thereon, each recess including a relatively steep surface portion and a relatively shallow surface portion connected to the relatively steep surface portion; and

an adapter having means for coupling the adapter to the nut, said adapter having an outer periphery and a radial bore extending thereinto from said outer periphery, there being means for mounting an electrical conduit on said adapter when the conduit is to be coupled to the connector;

a ball;

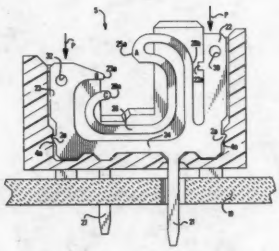
a coil spring, said ball and spring being in said bore with the spring being under compression for biasing the ball outwardly of the bore and into an adjacent said recess of the nut when the nut is coupled with the adapter, said ball being engageable with one of the surface portions of a said recess, the steepness and shallowness of the surface portions being sufficient to cause a relatively large force to be required to rotate the nut in one direction and to cause a relatively small force to be required to rotate the nut in the opposite direction.

4,984,996

PRINTED CIRCUIT BOARD EDGE CONNECTOR

Tetsuya Watanabe, Sagamihara; Yoshio Sato, Tsukui; Tsutomu Nakamura, Kawasaki; Naoki Kumagai, Machida, and Takashi Kamono, Yokohama, all of Japan, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 10, 1990, Ser. No. 550,602
Claims priority, application Japan, Jul. 10, 1989, 1-177787; Jul. 17, 1989, 1-184205; Sep. 20, 1989, 1-244313
Int. Cl.[5] H01R *13/54*
U.S. Cl. 439—326 **5 Claims**



1. In an edge connector (5) to receive an edge of a circuit board (6) to interconnect contact points on said circuit board (6) with other electrical circuits, a circuit board edge connector (5) comprising a housing (4) and contact(s) (2) disposed in said housing (4) characterised in that:

each of said contacts (2) is integrally made of a resiliently deformable metal plate comprising a tine section (21,27) extending downwardly, a horizontal base section (24) having upwardly extending first and second supports (22,23) at both ends thereof, a stand-up section (25) extending upwardly from said base section (24) inside of said first support (22) and then curving toward said second support (23) and a C-shaped section (26) extending downwardly in a C-shaped manner from the tip (25*a*) of said stand-up section (25) in a U-shape and sequentially along said stand-up section (25), the horizontal portion of said base section (24), and said second support (23);

the tip (25*a*) of said stand-up section extends toward said second support (23) to define a first contact point (A); and

the tip (26*a*) of said C-shaped section (26) extends toward said first contact point to define a second contact point (C) with said circuit board (6) being received between said first and second contact points (A,C).

4,984,997

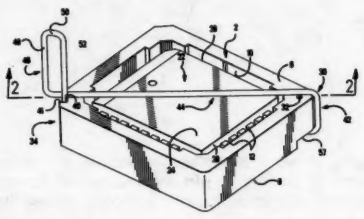
LOCKING CLIP FOR USE WITH A CHIP CARRIER SOCKET

Iosif Korsunsky, Harrisburg; Steven P. Bateman, Hummelstown, and Dimitry G. Grabbe, Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 372,982, Jun. 28, 1989, abandoned. This application Nov. 3, 1989, Ser. No. 431,271

Int. Cl.[5] H01R *13/629*

U.S. Cl. 439—331 21 Claims



1. A latch device for use with a chip carrier socket, the chip carrier socket having a first major surface and an oppositely facing second major surface, a recess provided in the chip carrier socket for the receipt of a chip carrier therein, the recess extending from the first major surface toward the second major surface, the latch device comprising:

a latch means having a mounting means, an engagement means, and a resilient retention means, the latch means being movable between an open position and a closed position, the engagement means cooperate with the chip carrier to retain the chip carrier in the recess when the latch means is in the closed position;

overstress means provided on the resilient retention means, the overstress means cooperate with the resilient retention means to insure that the resilient retention means will not take a permanent set during the operation thereof.

4,984,998

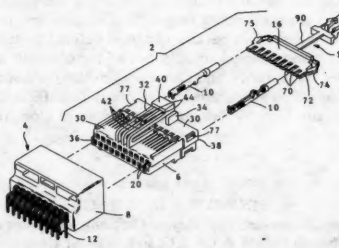
HIGH DENSITY ELECTRICAL CONNECTOR

Frank L. Duncan, Madison; Donald W. K. Hughes, Kernersville, and Bobby G. Ward, King, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 15, 1989, Ser. No. 450,953

Int. Cl.[5] H01R *13/627*

U.S. Cl. 439—352 29 Claims



1. An electrical connector comprising:

an insulative housing;

a plurality of terminals positioned within the insulative housing;

a connector latch on the insulative housing for latching the insulative housing in mating engagement with a mating connector;

terminal position assurance means engageable with the terminals for holding the terminals in the housing; and

connector position assurance means engageable with the connector latch for holding the latch in engagement with the mating connector;

the connector being characterized in that the terminal position assurance means and the connector position assurance means are part of a separate, one piece member.

4,984,999

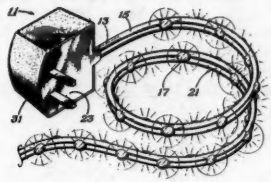
STRING OF LIGHTS SPECIFICATION

Sam S. Leake, 4421 Lorraine Ave., Dallas, Tex. 75205

Filed May 17, 1990, Ser. No. 524,468

Int. Cl.[5] H01R *4/24*

U.S. Cl. 439—425 12 Claims



1. A string of lights comprising:

a. a plurality of elongate electrical conductor disposed adjacent each other at parallel, spaced apart a standard distance and surrounded by respective soft penetrable insulating material and electrically connected with a plug for plugging into an electrical circuit; and

b. a plurality of light emitting diodes, having a plurality of respective conducting conductors connected for energization, said respective conductors having sharpened ends adapted to penetrate said insulating material when pushed thereinto; such that electrical continuity through said light emitting diodes is effected and a string of lights is formed when said light emitting diodes are pushed into electrical contact with said electrical conductors by having their sharpened end conductors pushed into electrical -continuity with said electrical conductors.

4,985,000

SHIELDED CABLE TERMINATION ASSEMBLY

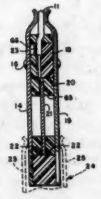
John N. Tengler, and Roy A. Gobets, both of Chico, Calif., assignors to Minnesota Mining and Manufacturing Co., Saint Paul, Minn.

PCT No. PCT/US87/02437, § 371 Date Mar. 28, 1989, § 102(e) Date Mar. 28, 1989, PCT Pub. No. WO88/02561, PCT Pub. Date Apr. 7, 1988

Continuation-in-part of Ser. No. 913,723, Sep. 30, 1986, Pat. No. 4,786,257. This PCT application Sep. 29, 1987, Ser. No. 348,725

Int. Cl.[5] H01R *13/658*

U.S. Cl. 439—497 15 Claims



1. A cable termination assembly electrical cable means including plural wire conductors; plural electrical contact mem-

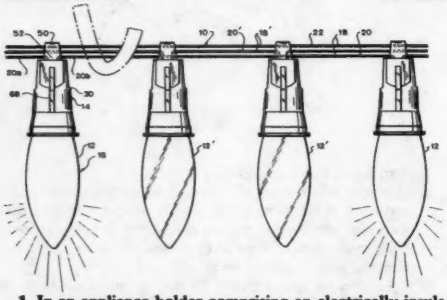
bers having forward contacting portions and rearward coplanar tail portions, at least one of said coplanar tail portions having attached thereto a respective one of said conductors; an electrical bus located generally rearwardly of said coplanar tail portions of said contact members, the tail portions of at least two of said contact members being attached to said electrical bus and said electrical bus being spaced from the tail portion of at least one other of said contact members to which one of said conductors is attached; and housing means for holding said conductors, contact members and electrical bus with respect to one another.

4,985,001

ELECTRICAL APPLIANCE HOLDER

Toshio Nagai, Changwon, Rep. of Korea, assignor to Minami International Corp., New York, N.Y.

Filed Jan. 16, 1990, Ser. No. 464,994
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—527 **20 Claims**



1. In an appliance holder comprising an electrically insulative housing defining a first cavity for receiving an electrical appliance and a second cavity for receiving a pair of electrical wires, and electrically conductive contact means for operatively connecting the electrical appliance and the pair of wires;

the improvement comprising a generally U-shaped clip of electrically insulative resilient material defining a pair of legs and a bight connecting said legs, said bight and legs being configured and dimensioned to pass around a plurality of other electrical wires, and the free ends of said legs being received within and releasably engaging said second cavity of for integrating said clip, said appliance holder, the pair of wires, the other electrical wires, and the electrical appliance for movement as a unit.

4,985,002

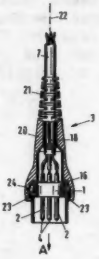
SHIELDED CIRCULAR PLUG CONNECTOR

Gunter Maisch, Bad Neustadt; Alfons Haag, Bastheim, both of Fed. Rep. of Germany, and Ken Wood, Lake Zurich, Ill., assignors to Preh, Elektrofeinmechanische Werke Jakob Preh, Nachf, GmbH & Co., Bad Neustadt/Saale, Fed. Rep. of Germany

Filed Oct. 25, 1988, Ser. No. 261,857
Int. Cl.[5] H01R *13/658*
U.S. Cl. 439—607 **5 Claims**

1. A shielded circular plug connector for a cable provided with a support part and pin or socket contacts fixed there and a jacket completely sealing the plug connector from electromagnetic radiation which includes a conductive tubular shield sleeve having a central axis therethrough and having no lateral openings through the sleeve, and which is made of semifinished material and which extends over the length of the plug connector to a cable holder thereon, the support part being immobilized against rotational and linear displacement in the shield sleeve,

wherein the shield sleeve is provided with a stop against which abuts the support part which is introduced in a direction counter to the insertion direction, the support part having at least two oppositely located, integrally molded spring elements which exert spring action in a direction relative to the shield sleeve axis, the shield sleeve contains radially raised embossings lines up with the



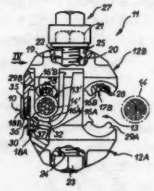
spring elements into which embossings the spring elements of the support part abutting against the stop can automatically latch, thereby immobilizing said support part.

4,985,003

BRANCHING ELECTRICAL CONNECTOR AND SPACER THEREFOR

Pierre Francois, Limoges, and Michel H. M. F. Prodel, Troche, both of France, assignors to S.I.C.A.M.E. Societe Industrielle de Construction d'Appareils et de Material Electrique, Arnac Pompadour, France

Filed May 9, 1989, Ser. No. 351,378
Claims priority, application France, May 13, 1988, 88 06465
Int. Cl.[5] H01R *4/40, 4/44*
U.S. Cl. 439—781 **34 Claims**



1. Spacer for use in a branching electrical connector comprising two jaws, clamping means for clamping the jaws together and at least two parallel channels defined by the jaws, the spacer being adapted to hold one of the channels at least partly open temporarily, and comprising overridable abutment means adapted to be disabled in response to sufficient force applied to the jaws by the clamping means to close the one channel.

4,985,004

ROUND PIN BUSHING

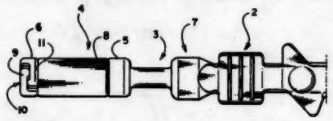
Bernd Zinn, Ennepetal, Fed. Rep. of Germany, assignor to Grote & Hartmann GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 274,191
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1987, 8715509[U]
Int. Cl.[5] H01R *11/22*
U.S. Cl. 439—851 **6 Claims**

1. A round pin bushing that functions as an electric contact element in combination with a plug pin, comprising:

a punched sheet metal part having a contact area including

an orifice area for receiving a plug pin, and having a crimped area for connection to an electric lead;
an outer spring sleeve fitted on the contact area;
the orifice area being provided with an expansion lock having a first hook piece (9) extending in circumferential



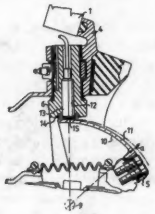
direction and a second hook piece (11) positioned behind and in axial alignment with the first hook piece for selective mutual engagement with the first hook piece; and
a radial clearance between the first and second hook pieces so as to permit expansion of the orifice.

4,985,005

BOAT-PROPELLER UNIT

Per Nestvall, Göteborg, and Christian Rodskier, Torslanda, both of Sweden, assignors to AB Volvo Penta, Göteborg, Sweden

Filed Oct. 25, 1989, Ser. No. 426,448
Claims priority, application Sweden, Nov. 24, 1988, 8804250
Int. Cl.[5] B63H *5/12*
U.S. Cl. 440—2000 **5 Claims**



1. In a boat-propeller unit comprising a carrier which can be mounted rigidly on a boat-transom, and a propeller-leg which is carried by the carrier and which can be adjusted to different angles relative to the carrier, by tilting the propeller-leg about a horizontal axis, and which can be swung about a steering axis which lies in a vertical plane, wherein means are provided for transmitting a signal contingent on the tilt-angle of the propeller-leg to an angle-indicating instrument; the improvement in which said means comprises a sensor (13) of the kind which produces an output signal which is dependent on the distance to a surface on an object, and an object (10) adjacent the sensor; the sensor and the surface on said object being so arranged in relation to one another on the carrier (4) and the propeller-leg (5) respectively that the distance therebetween changes in response to changes in the tile-angle on the propeller-leg thereby to change the sensor output signal.

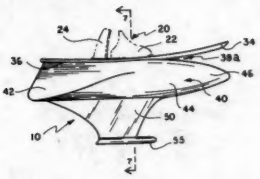
4,985,006

AQUATIC RECREATIONAL EQUIPMENT

Roberto L. Brunet, Ahuehuetes Nte. 918, Bosques de Las Lomas 11700 D.F., Mexico

Filed Jun. 22, 1989, Ser. No. 369,941
Int. Cl.[5] B63B *35/83*
U.S. Cl. 441—076 **9 Claims**

1. Aquatic recreational equipment for facilitating rhythmic movement on water surface by manual propulsion, said equipment including a pair of hydrodynamically designed flotation skis, wherein each ski comprises:
an elongated ski-shaped member having a generally flat upper surface which defines an upwardly turned front end and a bottom surface;
a sealed buoyant hull extending substantially the length of said elongated ski-shaped member and including a stern section and a mid-hull section integrally attached to said bottom surface of the elongated ski-shaped member, and a



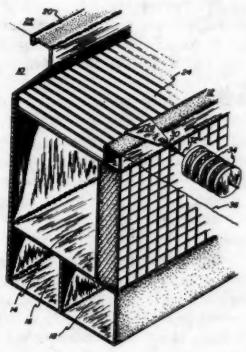
protruding conical-shaped bow section, whereby said bow section and said upwardly turned front end of the ski member define a space therebetween;
a keel extending along the center of said sealed buoyant hull and rigidly affixed thereto; and
an adjustable boot secured to said flat upper surface of the ski-shaped member and positioned medially thereof.

4,985,007

SWIMMING LANE MARKER SYSTEM

Herbert S. Ellis, Menands, N.Y., assignor to Aquatic Amusement Associated, Ltd., Cohoes, N.Y.

Filed Oct. 19, 1989, Ser. No. 424,051
Int. Cl.[5] B63B *51/00*
U.S. Cl. 441—133 **5 Claims**



5. A detachable anchor clip for use in a swimming lane marker system comprised of a first plate connected to a second plate generally at a right angle, said second plate having a pin mounted thereon for detachably securing said clip in a fixed position, along the gutter lip of a pool, said pin with its axis and its length running generally parallel to the first plate, wherein an elastic marker cable may be attached to said first plate and said pin inserted into a hole in the inside of a pool gutter lip thereby enabling the tension within the elastic marker cable to prevent the clip from moving from its fixed position.

4,985,008

WRESTLER CHARACTER FIGURE

Daniel W. Price, Chepachet, R.I., assignor to Hasbro, Inc., Pawtucket, R.I.

Filed Feb. 6, 1990, Ser. No. 475,843
Int. Cl.[5] A63H *13/10, 13/06, 13/00*
U.S. Cl. 446—308 1 Claim

1. A wrestler character figure comprising:

(a) a main body member receivable in free standing relation on a supporting surface, said main body member including a leg portion, a torso portion supported on said leg portion, and a head and neck portion supported on said torso portion;

(b) a first arm portion pivotally mounted on said torso portion for movement between an upwardly extending first position and a downwardly extending second position;

(c) a first hand portion on said first arm portion;

(d) a second arm portion pivotally mounted on said torso portion for movement between an upwardly extending first position and a downwardly extending second position;

(e) a second hand portion on said second arm portion; and

(f) means biasing said first and second arm portions toward the second positions thereof, said biasing means connecting said first and second arm portions together for movement together between the respective first and second positions thereof;

(g) said first and second arm portions pivoting forwardly and downwardly for movement from the first positions thereof to the second positions thereof, said first and second arm portions and said first and second hand portions being positioned so that said first and second arm portions extend substantially directly vertically upwardly and said first and second hand portions are in substantially horizontally disposed upwardly facing positions when said first and second arm portions are in the first positions thereof and so that said first and second hand portions face at least partially downwardly when said first and second arm portions are in the second positions thereof to enable said first and second hand portions to be utilized for supporting an opponent character figure above said neck and head portion when said first and second arm portions are in the first positions thereof and for throwing said opponent character figure directly downwardly toward said supporting surfaces as said first and second arm portions are moved to the second positions thereof.

4,985,009

TENSIONING DEVICE FOR CHAIN OR BELT DRIVES

Dieter Schmidt, Nuremberg, and Bolko Schusell, Erlangen, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed May 23, 1990, Ser. No. 528,930
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1989, 3922037
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—110 8 Claims

1. A tensioning device for chain or belt drives comprising a damping piston guided in a cylindrical housing and loaded in a chain tensioning direction by a compression spring located in the housing, wherein a high pressure chamber for hydraulic fluid is situated between a housing bottom and the damping piston and is open via a leakage gap formed by a guide bore of the housing and the damping piston and closed with respect to an oil reservoir by a non-return valve, an hydraulic pressure in the high pressure chamber during the operation of the tensioning device being higher in a cold state than in a heated state due to differences in viscosity, characterized in that the high pressure chamber is delimited by an additional piston acting as overpressure piston on which a second compression spring acts in a direction of the high pressure chamber, the overpressure piston being able to bear against a fixed stop and a spring force of the second compression spring and the effective surface of the overpressure piston are so dimensioned that in the cold state, the overpressure piston is displaceable by a force applied to it by the hydraulic pressure and in the heated state, it is retained at the fixed stop by the second compression spring.

4,985,010

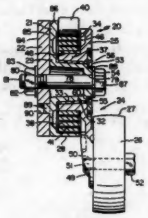
BELT TENSIONER AND METHOD OF MAKING THE SAME

Dewey D. Henderson, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 376,795, Jul. 7, 1989, Pat. No. 4,906,222.
This application Jan. 4, 1990, Ser. No. 461,149
The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—135 17 Claims

1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, said support means

comprising a housing means containing said spring means therein, said support means comprising an arm plate means, said support means comprising a shaft means interconnecting said arm plate means to said housing means, said belt engaging means comprising an arm rotatably mounted on said shaft means and having a portion disposed intermediate said arm plate means and said housing means so as to be rotatable relative thereto, and a bushing means disposed between said portion of said arm and said arm plate means to facilitate movement therebetween, the improvement wherein said arm plate means has an extension extending around said portion of said arm and being operatively interconnected to said housing means to tend to prevent cocking of said arm on said shaft means when said belt engaging means is tensioning said belt and to tend to frictionally dampen the rotational movement of said arm relative to said arm plate means.



4,985,011
AUTOMATIC TRANSMISSION

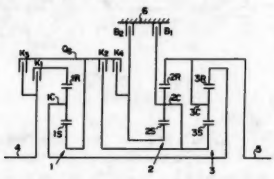
Toshiyuki Asada; Yasuhiko Higashiyama; Yasunori Nakawaki; Toshitake Suzuki; Akiharu Abe, and Naoki Moriguchi, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 5, 1990, Ser. No. 475,304

Claims priority, application Japan, Feb. 3, 1989, 1-25319; Feb. 3, 1989, 1-25320; Feb. 3, 1989, 1-25321; Feb. 3, 1989, 1-25322; Mar. 10, 1989, 1-58406; Mar. 15, 1989, 1-63385; Apr. 27, 1989, 1-108183; May 10, 1989, 1-116797

Int. Cl.[5] F16H *57/10*

U.S. Cl. 475—278 35 Claims



1. An automatic transmission including gear trains, which are constructed of at least three planetary gear sets each having three rotating members, i.e., a sun gear, a carrier and a ring gear for changing the speeds of the rotations of an input shaft and transmitting the same to an output shaft, the first and second ones of said three planetary gear sets being arranged adjacent to and at an extension of the axis of said input shaft, comprising:

first clutch means arranged closer to said input shaft than said first planetary gear set for connecting any one of the rotating members of said first planetary gear set arranged adjacent to said input shaft;

second clutch means arranged closer to said input shaft than said first planetary gear set for connecting another of the rotating members of said first planetary gear set and said input shaft;

third clutch means interposed between said first planetary gear set and said second planetary gear set for connecting any one of the rotating members of said second planetary gear set arranged at the opposite side to said input shaft across said first planetary gear set and said any one or said another of the rotating members of either one of said first clutch means and said second clutch means or said first planetary gear set; and

fourth clutch means interposed between said first planetary gear set and said second planetary gear set for connecting said another of the rotating members of said second planetary gear set and said any one or said another of the rotating members of said first clutch means, said second clutch means or said first planetary gear set.

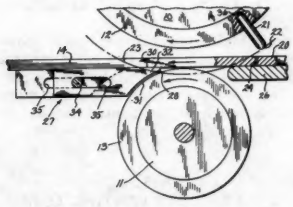
4,985,012
APPARATUS FOR STRIPPING SCRAP FROM DIE CUT BLANKS

Carl R. Marschke, Phillips, Wis., assignor to Marquip Inc., Phillips, Wis.

Filed Sep. 19, 1989, Ser. No. 409,112

Int. Cl.[5] B31B *1/74;* B26F *1/00*

U.S. Cl. 493—373 35 Claims



1. An apparatus for striping the cutout scrap portion from a die cut blank comprising:

lower support means for supporting the blank and providing yieldable support for the scrap portion;

a plurality of stripper pins each including a relatively blunt outer end and a relatively sharp inner end disposed above the blank;

stripper in support means for moving said stripper pins downwardly to bring the blunt outer ends thereof into nonpenetrating surface engagement with the scrap portion and for stripping the scrap from the blank; and,

said support means including a stripper pin support matrix comprising a layer of a resilient deformable material into which the inner ends of said stripper pins are demountably inserted.

4,985,013
METHOD AND AN APPARATUS FOR FOLDING PAPERLIKE MATERIAL, SUCH AS DOCUMENTS, WHICH MAY DIFFER IN QUALITY AND LENGTH AND WHICH ARE CONVEYED IN ASSEMBLED FORM OR SUCCESSIVELY

Jelchienus A. van der Werff, Montfoort, and Robert van Wijk, Harkema, both of Netherlands, assignors to Hadewe B.V., Drachten, Netherlands

Filed Oct. 14, 1988, Ser. No. 257,816

Claims priority, application Netherlands, Oct. 14, 1987, 8702456

Int. Cl.[5] B65H *45/18*

U.S. Cl. 493—444 10 Claims

1. An apparatus for folding paperlike material, such as documents, comprising:

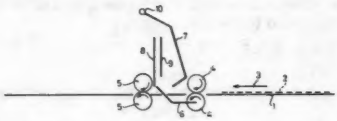
a transport track having transport means for transporting the

paperlike material, and folding rollers arranged downstream of said transport means as viewed in the transport direction;

a swiveling folding blade having a free end that swivels into a nip between two folding rollers, said free end swiveling substantially tangentially to said transport track; and

guide means arranged between said transport means and said folding rollers, said guide means including

deflection means for deflecting at least a leading edge of said paperlike material and including a guide member having a deflection face arranged between said transport means and said folding rollers, said deflection face arranged for swiveling between a first position intersecting said transport



track and a second position that does not intersect said track,

a guide plate that is substantially contiguous to said deflection face when said guide member is in said first position, said guide plate being positioned between said transport means and said folding rollers outside said transport track, and

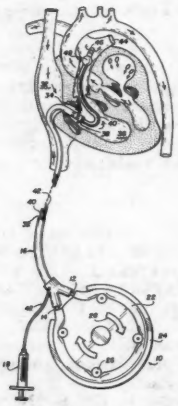
a second guide plate arrangement upstream and substantially parallel to said guide plate at a relatively small distance from said guide plate, said second guide plate being arranged in a swiveling relationship to said guide plate, and a distance between said guide plate and said second guide plate being variable.

4,985,014

VENTRICULAR VENTING LOOP

Wilmo C. Orejola, 1012 Black Oak Ridge Rd., Wayne, N.J. 07470

Filed Jul. 11, 1989, Ser. No. 378,267
Int. Cl.[5] D01N *1/362*
U.S. Cl. 600—16 **8 Claims**



1. Ventricular assisting apparatus for bypassing portions of the heart while maintaining coronary circulation, said apparatus comprising:

a variable output pump having a fluid input port and a fluid output port;

a catheter having first and second conduits, each conduit having first and second ends, said catheter having diameter means substantially therealong for passage in femoral blood vessels and heart passages;

the first end of said first conduit having fluid inflow terminal means for insertion through the blood stream of a patient and into the heart ventricle, the second end of said first conduit coupled to the fluid input port of said pump; and

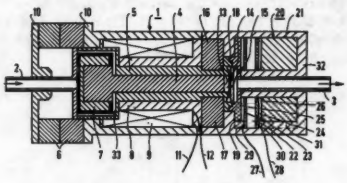
the first end of said second conduit having fluid outflow terminal means for insertion through said blood stream of said patient to a location downstream of said inflow terminal means, said second end of said second conduit coupled to the fluid output terminal means of said pump, whereby blood is withdrawn through the fluid inflow means form the heart ventricle, passed through the catheter and perfused through the fluid outflow means into the blood bypassing portions of the heart.

4,985,015

DOSING DEVICE FOR CONTROLLED INJECTION OF LIQUID FROM A RESERVOIR INTO AN ORGANISM

Peter Obermann, Erlangen, and Manfred Franetzki, Uttenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 275,366
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1987, 3739972; European Pat. Off., Jul. 20, 1988, 88111725
Int. Cl.[5] A61M *5/20*
U.S. Cl. 604—67 **21 Claims**



1. A dosing device for injecting liquids from a reservoir into an organism comprising:

pump means for transferring said liquid said reservoir to said organism in a selected dose, said pump means including a cylinder housing with a movable piston disposed in said cylinder housing, said pump means further including energizable electromagnetic excitation means for moving, if energized, said piston from a rest position in said cylinder housing through a stroke to convey said liquid through said pump means to said organism, and restoring means for returning said piston to said rest position when the electromagnetic excitation means is not energized;

noise sensor means arranged relative to said pump means for obtaining a signal representing a time-dependent curve of the piston motion for each stroke;

means connected to said noise sensor means for monitoring the amplitude of said curve; and

means in communication with said means for monitoring the amplitude of said curve for generating a corrective signal, if needed, based on said amplitude of said curve.

4,985,016
INTRAVENOUS SYSTEM FOR DELIVERING A BENEFICIAL AGENT

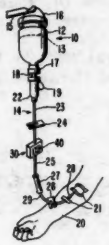
Felix Theeuwes, and Su I. Yum, both of Los Altos, Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Feb. 15, 1989, Ser. No. 311,905

The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.

Int. Cl.[5] A61M *37/00*

U.S. Cl. 604—85 **25 Claims**



1. An agent formulator for use in a parenteral fluid delivery system, the formulator comprising:

(a) a chamber having a fluid inlet means connectible to a reservoir of parenterally acceptable fluid and a fluid outlet means to maintain a continuous flow of the parenteral fluid therethrough, the chamber having a wall portion comprised of a material that is (1) permeable to a beneficial agent to be delivered into the fluid and (2) prevents convective flow of parenteral fluid therethrough, the wall portion having an interior surface and an exterior surface which is accessible from the exterior of the formulator; and

(b) a transdermal-type agent delivery device attached to the exterior surface of the wall portion, the delivery device comprising a reservoir containing the beneficial agent, the reservoir being releasably attached to the exterior surface of the wall portion;

wherein in operation, the fluid flowing through the chamber contacts an interior surface of the wall portion, causing the agent to be delivered from the device through the wall portion and into the flowing fluid.

4,985,017
PARENTERAL THERAPEUTICAL SYSTEM COMPRISING DRUG CELL

Felix Theeuwes, Los Altos, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 797,307, Nov. 12, 1985, Pat. No. 4,865,585, which is a continuation-in-part of Ser. No. 702,973, Feb. 19, 1985, Pat. No. 4,740,201, Ser. No. 664,802, Oct. 25, 1984, Pat. No. 4,790,820, and Ser. No. 588,165, Mar. 9, 1984, which is a continuation-in-part of Ser. No. 312,491, Oct. 19, 1981, Pat. No. 4,552,555, which is a continuation-in-part of Ser. No. 289,082, Jul. 31, 1981, abandoned, said Ser. No. 702,973, is a continuation-in-part of Ser. No. 310,047, Oct. 9, 1981, Pat. No. 4,511,353, which is a continuation-in-part of Ser. No. 283,077, Jul. 13, 1981, abandoned, said Ser. No. 664,802, is a continuation-in-part of Ser. No. 576,929, Feb. 3, 1984, abandoned, which is a division of Ser. No. 377,831, May 13, 1984, Pat. No. 4,439,183, which is a continuation-in-part of Ser. No. 310,047,. This application Apr. 25, 1989, Ser. No. 342,840

Int. Cl.[5] A61M *37/00*

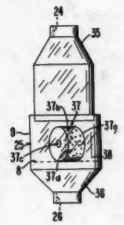
U.S. Cl. 604—92 **1 Claim**

1. A cell comprising:

(a) a wall defining a lumen having a first end and a second end;

(b) said first end having means connectible to a parenteral administration set, which set comprises a source of fluid for delivering the fluid to the cell and an output portion for parenterally administering the fluid to a patient;

(c) said second end comprising means for connecting to the output portion of said administration set, and wherein;



(d) said cell comprises a tablet, which tablet comprises a therapeutic composition formulated in a matrix, which matrix regulates the rate at which said therapeutic composition is released into said fluid when said fluid flows through said cell that is adapted for formulating a therapeutic composition with said fluid.

4,985,018
CATHETER GRIP

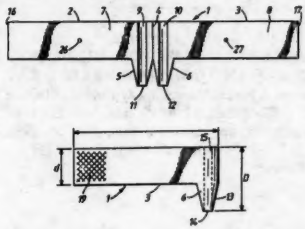
Michael F. Smith, Harston, England, assignor to Cambridge Autotransfusion Service, Cambridge, England

Filed Feb. 14, 1989, Ser. No. 310,764

Claims priority, application United Kingdom, Feb. 15, 1988, 8803467

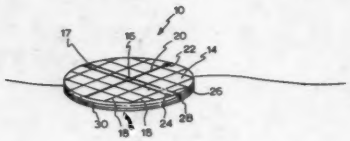
Int. Cl.[5] A61M *5/00*

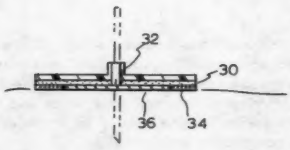
U.S. Cl. 604—161 **8 Claims**



1. A catheter grip for use in a method of inserting a catheter employing a peel sheath, said grip comprising first and second members, and single hinge means interconnecting said first and second members whereby said members can be closed together about said hinge means to bracket said catheter and said members can be held by one hand so that said catheter is held firmly between said members but without damaging said catheter, each of said first and second members having a spigot forming portion which cooperates with the respective portion of the other of said members to define a hollow spigot for receiving said catheter therethrough when said members are closed together, said spigot having a tip which is substantially symmetrical about the axis of said spigot, and said spigot being externally tapered to a thin circular edge at said closely around the entire in use, said tip will fit closely around the entire circumference of said catheter and within said peel sheath to form a seal between said catheter and said sheath in front of the advancing split as said sheath is withdrawn and split apart, said hinge means being located between said spigot forming portions.

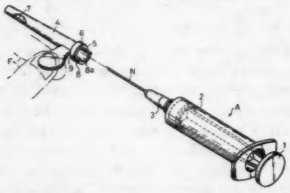
4,985,019
X-RAY MARKER
Gary K. Michelson, 438 Sherman Canal, Venice, Calif. 90291
Filed Mar. 11, 1988, Ser. No. 167,168
Int. Cl.[5] A61F *13/02*
U.S. Cl. 604—180 **8 Claims**





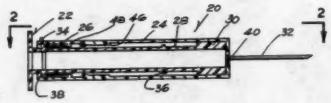
1. A radiographic marker comprising:
first substantially rigid disc member having at least a portion thereof radio opaque, said radiographic opaque portion of said disc in the form of a grid, said member having a top surface and a bottom surface and a circular opening in said disc, the central axis of said opening substantially perpendicular to the plane of said disc and adapted to permit the tip of a needle to pass therethrough and be supported by the walls of said opening and adhesive applied to said bottom surface for applying said marker to the body of a patient.

4,985,020
NEEDLE CAP FOR INJECTOR, GUIDE FOR NEEDLE CAP AND GRIP FOR NEEDLE CAP
Shiro Kasuya, 4 Nakashin-machi, Gifu-shi, Gifu-ken, 500, Japan
Filed Jun. 21, 1989, Ser. No. 369,116
Claims priority, application Japan, Jun. 24, 1988, 63-157751
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **4 Claims**



1. A needle cap adapted to cover a needle of an injector, comprising:
a cylindrical cap body for covering said needle and having an opening at its longitudinal end;
a grip portion provided on said cap body and extending substantially in the radial direction of said cap body; and
a guiding portion provided on a part of the circumference of said cap body opening and extending substantially in the longitudinal direction of said cap body, said guiding portion including a needle support surface extending therefrom for a length shorter than that of said needle, whereby a needle may be positioned onto the needle support surface by movement along a radial direction thereof, and subsequently moved inwardly along a longitudinal direction thereof into said cap body through said opening, said guiding portion having a substantially arcuate section and said needle support surface being substantially wider than the diameter of said needle.

4,985,021
SAFETY ENCLOSURE SYSTEM FOR MEDICAL DEVICES
Jeff Straw, 1347 Ramona Dr., Racine, Wis. 53406, and C. Thomas Sylke, Milwaukee, Wis., assignors to Jeff Straw, Racine, Wis.
Filed Jan. 31, 1989, Ser. No. 304,256
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—198 **1 Claim**

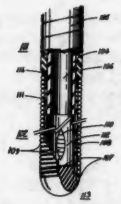


1. An improved anticontamination mechanism for a syringe having a needle attached thereto, consisting of:
a unitary and generally cylindrical tube having a needle attached at its first end to permit fluid to flow from said tube through said needle, said tube having an extended cylindrical shoulder at its first end, a locking ring intermediate said shoulder and the second end of said tube, a pin adjacent the second end of said tube, and an inner spring ring adjacent said pin;
a unitary sheath slidable on said tube between a first retracted position and a second extended position, said sheath having a hook engageable with said pin when said sheath is in said first position, an outer spring ring, a flange unidirectionally engageable with said locking ring to lock said sheath in said second position, and a ledge located near the longitudinal center of said sheath and engageable with said shoulder when said sheath is in said second position;
wherein said sheath is moved from said first position to said second position by a spring on said tube between said inner and outer spring rings when said hook is disengaged from said pin;
further wherein said sheath is positively locked in said second position by first locking means comprising said flange engaging said locking ring to prevent movement of said sheath back toward said first position and second locking means comprising said ledge engaging said shoulder to positively prevent further movement of said sheath away from said first position and to prevent subsequent removal of said sheath from said tube; and
further wherein approximately one half of said sheath concentrically engages said tube when said sheath is in said second position to further prevent subsequent removal of said sheath from said tube.

4,985,022
CATHETER HAVING DURABLE AND FLEXIBLE SEGMENTS
Neal E. Fearnot, West Lafayette; Melvin K. Hawkins, Bloomington, and Richard B. Sisken, West Lafayette, all of Ind., assignors to MED Institute, Inc., West Lafayette and Cook Incorporated, Bloomington, both of, Ind.
Filed Nov. 23, 1988, Ser. No. 275,435
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—282 **33 Claims**

1. A catheter comprising:
a durable elongated segment having a distal and a proximal end and a hollow passageway therebetween;

a more flexible elongated segment having a distal and a proximal end and a hollow passageway therebetween, said proximal end of said flexible segment and said distal end of said durable segment being joined together; and



a wire coil surrounding said flexible segment and being joined to said flexible segment at said distal end thereof.

4,985,023

ANTIMICROBIAL SUPERABSORBENT ARTICLES

Lynne M. B. Blank, Brighton, N.Y.; Thomas D. Boyce, and William C. White, both of Midland, Mich., assignors to Dow Corning Corporation and Dow Chemical Company, both of Midland, Mich.

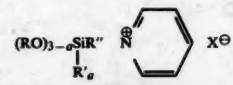
Continuation-in-part of Ser. No. 191,945, May 9, 1988. This application Oct. 23, 1989, Ser. No. 425,277

Int. Cl.[5] A61F *13/52, 13/46, 13/15, 13/20*

U.S. Cl. 604—360 **3 Claims**

1. An article comprising an outer layer of an organosilane treated polymer gel, and an inner layer of the polymer gel which is free of the organosilane, the rate at which the outer layer of the organosilane treated polymer gel absorbs a fluid with respect to time being slower than the rate at which the inner layer of the polymer gel which is free of the organosilane absorbs a fluid with respect to time, whereby there is established a differential rate of absorption between the inner layer and the outer layer as a function of time causing initial fluid migration to the inner layer, the polymer gel being a water absorbing crosslinked hydrophilic sodium salt form of a partially neutralized acrylic acid-based polymer gel, and the organosilane having the formula selected from the group consisting of

$$(RO)_{3-a}\underset{\underset{R'_a}{|}}{SiR''}N^{\oplus}R'''R''''R^{v}X^{\ominus} \text{ and}$$



wherein, in each formula,

R is an alkyl radical of 1 to 4 carbon atoms or hydrogen;

a has a value of 0, 1 or 2;

R′ is a methyl or ethyl radical;

R″ is an alkylene group of 1 to 4 carbon atoms;

R‴, R⁗ and R^{v} are each independently selected from a group consisting of 1 to 18 carbon atoms, $-CH_2C_6H_5$, $-CH_2CH_2OH$, $-CH_2OH$, and $-(CH_2)_xNHC(O)R^{vi}$, wherein x has a value of from 2 to 10 and R^{vi} is a perfluoroalkyl radical having from 1 to 12 carbon atoms; and X is chloride, bromide, fluoride, iodide, acetate or tosylate.

4,985,024

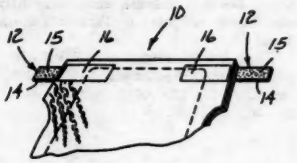
DISPOSABLE DIAPER HAVING FASTENING MEANS THAT ARE DEGRADABLE

Alan J. Sipinen, Hugo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 1, 1989, Ser. No. 444,519

Int. Cl.[5] A61F *13/58*

U.S. Cl. 604—389 **16 Claims**



1. A disposable diaper having diaper-fastening means comprising at least one member from the group of fastening tabs, release tapes and a frontal strip, which incorporates a degradable film backing comprising a polyolefin film containing a chemical prodegradant and an unsaturated elastomer wherein said film backing has sufficient tensile and tear strengths for use in a disposable diaper.

4,985,025

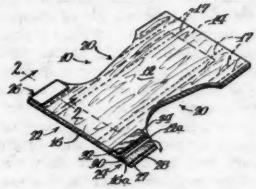
ADHESIVE CLOSURE SYSTEM FOR DISPOSABLE DIAPERS

Arnold Lingertat, and Morris K. Swieringa, both of Bucks County, Pa., assignors to McNeil-PPC, Inc., Milltown, N.J.

Continuation of Ser. No. 562,906, Dec. 19, 1983, abandoned. This application Jan. 31, 1986, Ser. No. 824,928

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—390 **2 Claims**



1. A disposable diaper comprising: a moisture pervious facing layer adapted to be positioned adjacent the wearer's body; an absorbent batt adjacent to said facing layer; and a moisture impervious backing layer adjacent to said absorbent batt, said facing and backing layers having a generally hour glass configuration and being larger than said absorbent batt and secured to one another outwardly of said absorbent batt, one end of said backing layer having closure means at opposite sides thereof, said closure means each including a portion of said backing layer extending outwardly of said facing layer, said portions of said backing layer being defined by ears extending outwardly from side marginal edges of said diaper at one end thereof, each of said portions including an adhesive free outer area defining a finger lift tab, said portions of said backing layer each further including a first pressure sensitive adhesive area coated directly thereon inwardly of its adhesive free outer area and a second adhesive area inwardly of the first adhesive area thereof, and release means inwardly of each of said first pressure sensitive adhesive areas, each of said release means being provided on the ear of said backing layer inwardly of said first pressure sensitive adhesive area thereof, each of said release means being defined by release strips releasably associated with said second adhesive area, whereby each of said portions of said backing layer may be folded inwardly to a storage position wherein its first pressure sensitive adhesive area is

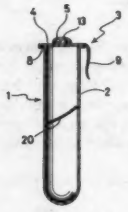
releasably secured to its associated release means, said portions of said backing layer being folded outwardly from said storage position to a working position by grasping the finger lift tab thereof to expose the pressure sensitive areas thereof for securement of the diaper about the torso of the wearer.

4,985,026

BLOOD COLLECTING TUBE

Masaaki Kasai; Sakae Yamazaki, and Sanae Miyake, all of Yamanashi, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1989, Ser. No. 387,026
Claims priority, application Japan, Aug. 3, 1988, 63-193608
Int. Cl.[5] A61B *19/00*
U.S. Cl. 604—403 **31 Claims**



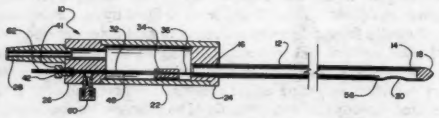
1. A blood collecting tube comprising a tubular member made of synthetic resin which has an open end and a closed bottom, said tubular member having an inner surface, and a closure member which is for closing said open end of said tubular member to maintain a reduced pressure condition inside said tubular member and allows a puncture needle to pierce therethrough, said tubular member made of a mixture of (a) a first polyester resin comprising at least one dicarboxylic acid component and at least one glycol component, said first polyester resin mainly based on ethylene glycol as the glycol component and terephthalic acid as the dicarboxylic acid component and (b) a second polyester resin comprising at least one dicarboxylic acid component and at least one dihydroxy compound component, said second polyester resin mainly based on ethylene glycol as the dihydroxy component and isophthalic acid as the dicarboxylic acid component, and said mixture contains said first polyester resin mainly based on ethylene glycol and terephthalic acid in an amount of 5 to 95% by weight of said mixture.

4,985,027

SOFT TISSUE ASPIRATION DEVICE AND METHOD

Thomas D. Dressel, 8725 Walton Oaks Clr., Bloomington, Minn. 65438

Filed Feb. 26, 1990, Ser. No. 485,081
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—15 **13 Claims**



1. An in vivo surgical method of aspirating soft tissue from a patient comprising:

inserting an aspiration cannula through the patient's epidermis, so that a distal end of the cannula is positioned in an area of soft tissue, said cannula provided with a central lumen in communication with an aspiration inlet port adjacent the cannula distal end;

providing laser energy from a laser energy source to a laser energy transmitting means operatively mounted in a laser guide tube, said guide tube mounted for longitudinally extending within the cannula lumen, for transmitting laser energy to a point adjacent said aspiration inlet port to perform localized soft tissue cutting and blood vessel coagulation;

transmitting fluid through said guide tube in flow contact with said laser transmitting means to provide cooling for and cleaning of said laser transmitting means; and

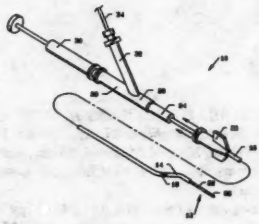
providing a source of aspiration at a proximal end of said cannula to aspirate soft tissue through said aspiration inlet port and said cannula.

4,985,028

CATHETER

Jeffrey M. Isner, and Richard Clarke, both of Boston, Mass., assignors to Angelon Corporation, Plymouth, Minn.

Filed Aug. 30, 1989, Ser. No. 400,701
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—15 **11 Claims**



1. An apparatus comprising:

a. a medical laser;

b. an optical fiber responsively coupled to said medical laser;

c. means engaged to said optical fiber for percutaneously advancing said optical fiber to a position adjacent a human heart, wherein said advancing means further comprises a catheter assembly; and,

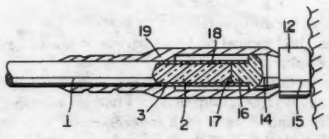
d. means coupled to said advancing means for maintaining said optical fiber in said position adjacent to said human heart, wherein said maintaining means further comprises a sigmoidal bend in said catheter assembly located within said human heart when said optical fiber is in said position adjacent to said human heart.

4,985,029

LASER APPARATUS FOR MEDICAL TREATMENT

Masahiko Hoshino, 989-3, Ohaza Uchino Hongo, Ohmiya-Shi, Saitama, Japan

Filed Jun. 2, 1989, Ser. No. 360,609
Claims priority, application Japan, Jan. 11, 1989, 1-4510
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—16 **3 Claims**



1. A laser treatment apparatus characterized by comprising a fiber waveguide member connected to a laser beam source and having a core presenting a tip portion including a core end

surface, and a tip member formed of a light-transmitting material having a low thermal conductivity and a high heat-resistant property, said tip member including an integral connecting portion formed thereon having substantially the same dimension as that of said core portion of said fiber waveguide member and presenting a connecting portion end surface, said end surfaces of said connecting portion and of the core portion integrally welded to each other by a welded portion.

4,985,030

BIPOLAR COAGULATION INSTRUMENT

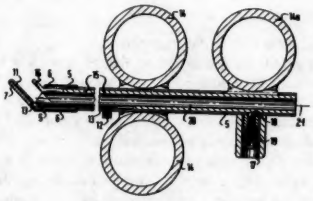
Andreas Meixer, Wiesbaden; Markus Naruhn, Lindlar; Karl Kipfmüller, Taunusstein; H. D. Reidenbach, Neunkirchen-Seelscheid, and Gerd Buess, Nieder-Olm, all of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, KnitHingen, Fed. Rep. of Germany

Filed Apr. 18, 1990, Ser. No. 511,476

Claims priority, application Fed. Rep. of Germany, May 27, 1989, 3917328

Int. Cl.[5] A61B *17/39*

U.S. Cl. 606—51 3 Claims



1. A bipolar coagulation instrument suitable for use with a mediastinoscope and a cutting instrument, and comprising:

(a) an outer barrel having a distal end and defining a longitudinal axis;

(b) an inner barrel situated within the outer barrel and having an internal longitudinal channel and a distal end;

(c) a first jaw member comprising two halves at the distal end of the outer barrel, the two halves being angled relative to the longitudinal axis and being spaced apart from one another;

(d) a second jaw member displaceable relative to the first jaw member along the longitudinal axis and comprising two halves at the distal end of the inner barrel, the two halves being angled relative to the longitudinal axis and being spaced apart from one another;

(e) at least one recess provided in at least one of the first and second jaw members and connected to an irrigation channel;

(f) wherein the first and second jaw members define two sets of jaw member halves, which sets are spaced apart from one another to define a gap, the gap being capable of receiving at least a part of the cutting instrument passed through the channel in the inner barrel.

4,985,031

LEFT AND RIGHT INFERIOR BORDER OSTEOTOMY BLADE SAW

Rick A. Buss, Camarillo, Calif., and Wilbur M. Davis, Orlando, Fla., assignors to Techmedica, Inc., Camarillo, Calif.

Filed Dec. 28, 1989, Ser. No. 458,505

Int. Cl.[5] A61F *17/32*

U.S. Cl. 606—82 24 Claims

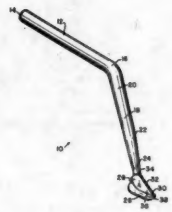
1. An osteotomy blade saw comprising:

a substantially straight first arm having a first free end and a second end;

a substantially straight second arm substantially coplanar with said first arm in a first plane, extending from said second end of said first arm and making an obtuse angle therewith at a first end and having a second, distal end;

a neck portion connected to said second end of said second arm, having a reduced cross section an making an acute angle with said second arm in a second plane substantially at right angles to said first plane;

a substantially straight end portion connected to a distal end of said neck portion at a first, proximal end and terminating in a second, free end, said end portion being disposed substantially in a third plane parallel to but displaced from said first plane, said end portion making a substantially



right angle with an imaginary line representing a projection of said second arm onto said third plane, and said end portion including a blade mounting means for mounting a cutting blade; and

a cutting blade mounted on said end portion, disposed in said third plane and having teeth extending generally away from said end portion;

wherein a reciprocating motion of said first arm along its length while at least some of said teeth of said cutting blade are in contact with a bone results in a sawcut in said bone.

4,985,032

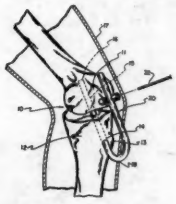
DRILL GUIDE

E. Marlowe Goble, 850 East 1200 North, Logan, Utah 84321

Filed May 14, 1990, Ser. No. 522,743

Int. Cl.[5] A61F *5/04*

U.S. Cl. 606—96 5 Claims



1. A drill guide comprising, a rod that is bent upon itself into a U-shape, forming parallel co-planar legs, one of which legs is solid for fitting into a straight bony tunnel, and the other leg is holed laterally at spaced intervals therealong the longitudinal axis of each of which holes points to said solid leg which holes are tapped; and a barrel means has an longitudinal bore open therethrough, and has a threaded external surface for turning through one of said holes.

4,985,033

APPARATUS FOR FIXING FASCIAL HOLDING SUTURES IN OPEN LAPAROSCOPY

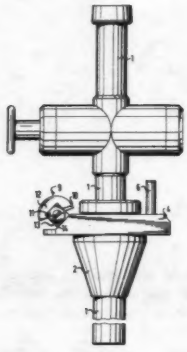
Manfred Boebel, Oetisheim, and Henning Becker, Neunkirchen, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Feb. 28, 1990, Ser. No. 486,464

Claims priority, application Fed. Rep. of Germany, May 12, 1989, 3915597

Int. Cl.[5] A61B *17/00*; A61M *5/32*

U.S. Cl. 606—148 8 Claims



1. Apparatus for fixing fascial holding sutures in open laparoscopy, the apparatus comprising:

a tapered seal defining an axial passage way for feeding therethrough a trocar canula holding a laparoscope, said seal having a distal end and a proximal end;

a retaining plate detachably securable to the proximal end of the tapered seal;

a plurality of manually operable clamping devices on the retaining plate for detachably fixing ends of said sutures; and

a push rod and a tension element in said retaining plate, the push rod having a hand lever for radially displacing the push rod to act upon the tension element detachably to secure the fixing apparatus to the trocar canula.

4,985,034

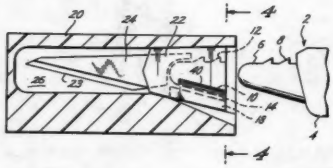
SAFETY SURGICAL BLADE, HANDLE AND SHIELD

James M. Lipton, Dallas, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jun. 1, 1989, Ser. No. 360,089

Int. Cl.[5] A61B *17/32*

U.S. Cl. 606—167 9 Claims



1. A scalpel comprising:

a handle having a forward end and a rearward grip end;

a blade having a forward cutting end and a rearward end adapted to releasably interengage the forward end of said handle, said rearward end comprising a handle socket having a weakened section in the direction of the cutting edge of said surgical blade; and

a removable and reattachable blade shield for encasing said blade.

4,985,035

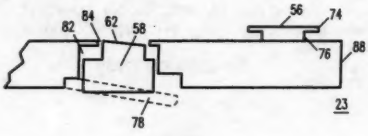
REMOVABLE HANDLE FOR BLADED SURGICAL INSTRUMENTS

Randall J. Torre, 842 S. Clover, San Jose, Calif. 95128

Filed Mar. 24, 1989, Ser. No. 328,441

Int. Cl.[5] A61B *17/32*

U.S. Cl. 606—167 14 Claims



1. A surgical instrument comprising:

an elongated, generally round handle having a lengthwise extending bore formed in a distal end thereof, said elongated handle having an indented area near said distal end contoured to accommodate a human thumb;

an elongated extension member, said extension member having a proximal end adapted for insertion in said bore for removably attaching said extension member to said elongated handle, said elongated extension member having a mounting surface formed adjacent a distal end thereof, a spring loaded push button mounted adjacent said extension member distal end biased for protruding through said mounting surface, said enlarged circular portion formed at the end of said slot away from said proximal end of said blade section, a mounting post protruding from said mounting surface adjacent said extension member distal end disposed in spaced relationship with said spring loaded push button, said mounting post disposed between said spring loaded push button and said extension member distal end, said mounting post having a flattened top forming a radially extending flange, said flange having a larger diameter than said mounting post; and

a blade section having first and second apertures formed therethrough disposed in spaced relationship at a proximal end thereof, said first aperture forming a lengthwise extending elongated slot one end of which being an enlarged circular portion having a diameter slightly larger than said mounting post flattened top for receiving said flattened top, said enlarged circular portion formed at the end of said slot away from said proximal end of said blade section, the width of said elongated slot being slightly greater than the diameter of said mounting post, said second aperture adapted for engaging said spring loaded push button and preventing lengthwise movement of said blade section when said proximal end thereof is placed in overlaying relationship with the distal end of said elongated extension member, a lower side of said blade section in contact with said mounting surface, said flattened top protruding through said enlarged circular portion of said elongated slot, and said elongated slot displaced lengthwise for slidingly engaging said mounting post, said radially extending flange engaging said proximal end of said blade section retaining said proximal end of said blade section tightly against said mounting surface of said elongated extension member.

4,985,036

ARTIFICIAL SKIN

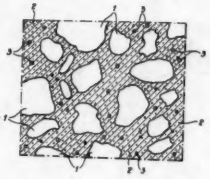
Etienne J. C. M. P. Lommen; Charles R. H. Wildevuur, and Wouter L. J. Hinrigs, all of Groningen, Netherlands, assignors to Koninklijke Utermohlin N.V., Utrecht, Netherlands

Filed Jul. 7, 1989, Ser. No. 376,604

Claims priority, application Netherlands, Jul. 8, 1988, 8801741

Int. Cl.[5] A61F *2/10*

U.S. Cl. 623—15 10 Claims



1. Artificial skin which transmits wound moisture, comprising

(a) an upper layer of an elastomer having a thickness of 0.01–0.2 mm which is provided with pores having a diameter not exceeding 0.7 μm and a pore density of 1–75% of the surface, and

(b) a lower layer of an elastomer having a thickness of 0.05–1 mm which is provided with macropores having a diameter of 50–200 μm interspersed throughout the thickness of said lower layer with micropores having a diameter of 0.1–0.25 μm.

4,985,037

UNIVERSAL MODULAR PROSTHESIS STEM EXTENSION

Thomas D. Petersen, 9680 Alto Dr., La Mesa, Calif. 92041

Filed May 22, 1989, Ser. No. 354,792

Int. Cl.[5] A61F *2/38*

U.S. Cl. 623—20 16 Claims

1. A modular prosthesis systems comprising:

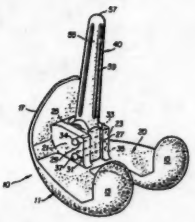
(a) a prosthetic head having an undersurface;

(b) mounting means on said undersurface including at least one flat surface;

(c) a plurality of diverse stem extensions, each stem extension having a shank with a flat surface complementary to the flat surface of said mounting means; and an elongated stem portion connected to its respective shank defining an obtuse angular relationship between said shank and a longitudinal axis of said stem portion; and

(d) attachment means for fixedly attaching a said shank to said mounting means;

(e) said shank being attachable to said mounting means in at



least two diverse fixed orientations wherein each said stem portion is connected to its respective shank at an angular relationship corresponding with an inclination of a bone which said stem is intended to be inserted.

4,985,038

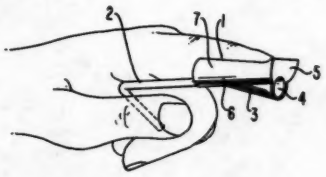
NEEDLE STOP SURGICAL INSTRUMENT

Mark S. Lyell, 2024 Barryton Rd., Oklahoma City, Okla. 73120

Filed Jun. 5, 1990, Ser. No. 533,529

Int. Cl.[5] A61B *17/04*

U.S. Cl. 506—148 9 Claims



1. A needle stop for receiving and guiding a needle during surgical procedures, comprising:

a finger housing for receiving a finger therein;

a handle connected to one end of said finger housing, said handle designed such that when one finger of a hand is received in said housing, the remaining fingers of the hand can grip said handle; and

means connected to said finger housing defining a needle receiving space for receiving and guiding a needle, said space having an opening for receiving a needle therethrough.

4,985,039

PRESERVING ANIMAL HIDES

Hans Endlweber, Vienna, Austria, assignor to Messer Griesheim GmbH, Fed. Rep. of Germany

Filed Jul. 26, 1989, Ser. No. 385,190

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827382

Int. Cl.[5] C14C *1/00*

U.S. Cl. 8—94.15 6 Claims

1. Process to conserve hides, characterized by the following steps:

(a) cleaning the hides after they have been skinned from the body of the animal in order to remove meat, blood, fat and other impurities;

(b) contacting the cleaned hides with CO_2 at a temperature of about −79° C. to provide a temperature which brings about a very rapid, shock freezing of the hides; and

(c) storing the frozen hides in a CO_2 atmosphere.

4,985,040

TREATMENT OF WOOLLEN TEXTILE MATERIAL

Derek W. Heywood, Cheadle Hulme, and Stuart B. Howarth, Cannock, both of England, assignors to BIP Chemicals, Ltd., Manchester, England

Filed Apr. 24, 1990, Ser. No. 513,677

Claims priority, application United Kingdom, May 20, 1989, 8911668; Nov. 16, 1989, 8925957

Int. Cl.[5] D06M *11/00, 15/00*

U.S. Cl. 8—128.1 6 Claims

1. In a process for the treatment of woollen textile material to reduce shrinkage and felting and improve resistance to abrasion, by depositing a polyamide-epichlorhydrin resin thereon, the improvement which comprises subsequently depositing a polyurethane onto the material from an aqueous polyurethane dispersion.

4,985,041

DYE ASSISTANT COMPOSITION FOR HYDROPHOBIC FIBERS

Ralph Matalon, 1528 Burnt Mill Rd., Cherry Hill, N.J. 08003

Continuation-in-part of Ser. No. 930,690, Nov. 10, 1986, which is a continuation of Ser. No. 792,224, Oct. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 581,314, Feb. 17, 1984, abandoned. This application Nov. 20, 1987, Ser. No. 123,383

Int. Cl.[5] C08K *5/05;* D06P *5/22*

U.S. Cl. 8—130.1 5 Claims

1. A textile dye assistant composition for use in the level dyeing of synthetic hydrophobic fibers and comprising:

(a) a non-phenolic, mononuclear, aromatic swelling agent for the fiber to be dyed and selected from the group consisting of toluene, xylene, trichlorobenzene, o-chlorotoluene and p-chlorotoluene; and

(b) as a dispersant for the swelling agent,

(i) at least one alcohol selected from the group consisting of cyclohexanol, methylcyclohexanol, benzyl alcohol, pentan-1-ol and 3-methyl-butan-1-ol;

(ii) at least one alcohol selected from the group consisting of n-butyl alcohol and isobutyl alcohol; and

(iii) a surfactant selected from the group consisting of alkyl sulfonic acids, alkylarylsulfonic acids, nonionic surfactants, and fatty acid soaps;

the ratio of swelling agent (a) to dispersant (b) being 10:1 to 50:1 by weight; the ratio of alcohol (i) to alcohol (ii) being about 0.4:1 to 3:1; the amount of surfactant (iii) being that amount sufficient to form an emulsion and disperse a dye to be used in the dyeing of the synthetic hydrophobic fibers; and the dye assistant composition having a range of clarity, which is the total volume of water in terms of a percentage that can be added to a volume of the composition before the onset of cloudiness following the onset of clarity, which does not exceed 35%.

4,985,042

NEW SUBSTITUTED METAAMINOPHENOLS, A PROCESS FOR THEIR PREPARATION, HAIR-DYEING COMPOSITIONS CONTAINING THEM AND A HAIR-DYEING PROCESS

Andrée Bugaut, Boulogne, and Alex Junino, Aulnay, both of France, assignors to L'Oreal, Paris, France

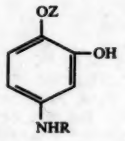
Division of Ser. No. 385,496, Jul. 26, 1989, which is a division of Ser. No. 618,149, Jun. 7, 1984, Pat. No. 4,863,480. This application Apr. 26, 1990, Ser. No. 514,534

Claims priority, application France, Jun. 13, 1983, 83 09734

Int. Cl.[5] A61K *7/13;* C07C *91/40, 91/42*

U.S. Cl. 8—421 21 Claims

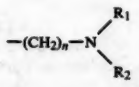
1. A metaaminophenol having the formula:



(I)

wherein

Z represents an aminoalkyl radical of the formula:



wherein n is an integer from 1–6, and R_1 and R_2, each independently, represent hydrogen, alkyl having 1–6 carbon atoms, hydroxyalkyl having 1–6 carbon atoms, or acyl having 1–4 carbon atoms, and

R represents hydrogen, alkyl, monohydroxyalkyl, polyhydroxyalkyl, monocarbamylalkyl, dicarbamylalkyl, aminoalkyl, acyl, carbalkoxy, carbamyl or monoalkylcarbamyl, wherein the alkyl moieties have 1–6 carbon atoms,

or an acid salt thereof.

4,985,043

MIXTURES OF MONOAZO DYES CONTAINING HALOGEN AND CYANO SUBSTITUENTS

Ulrich Bühler, Alzenau; Manfred Hähnke, Kelkheim; Reinhard Kühn, Frankfurt am Main, and Margarete Boos, Hattersheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

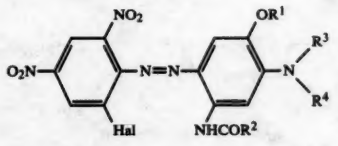
Filed Mar. 15, 1989, Ser. No. 323,876

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1985, 3810726

Int. Cl.[5] C09B *67/22, 29/085;* D06P *1/18, 3/54*

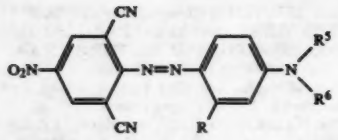
U.S. Cl. 8—639 7 Claims

1. Mixture of monoazo dyes which contains one or more dyes of the formula



(I)

and one or more dyes of the formula II



(II)

wherein Hal denotes bromo or chloro; R^1 and R^2, independently of one another each denote methyl or ethyl; R^3, R^4, R^5 and R^6, independently of one another, each denote linear alkyl having 1 to 4 carbon atoms or alkenyl having 3 to 4 carbon atoms; and R denotes methyl, acetylamino, propionylamino, i-butyrylamino, or n-butyrylamino.

4,985,044

MULTI-COMPONENT MIXTURES OF BLUE DISPERSE AZO DYES FOR THE DYEING OF SYNTHETIC FIBERS

Manfred Hähnke, Kelkheim; Reinhard Kühn, Frankfurt am Main, and Ulrich Bühler, Alzenau, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 7, 1989, Ser. No. 362,845

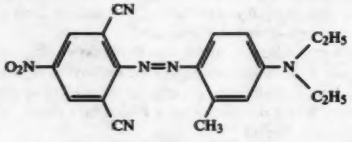
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1988, 3819563

Int. Cl.[5] C09B 67/22; D06P 1/18, 3/54

U.S. Cl. 8—639 **20 Claims**

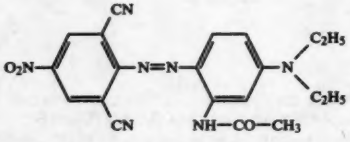
1. A dye formulation in the form of a multi-component mixture or a mixed crystal of blue-type disperse-azo dyestuffs for exhaust-dyeing synthetic fiber material, which comprises:

10 to 40 parts by weight of the dye of the formula I,



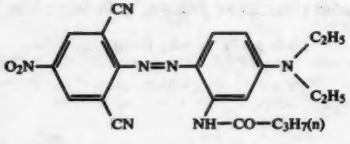
(I)

and 5 to 30 parts by weight of the dye of the formula II,

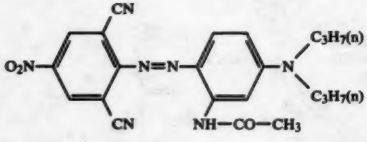


(II)

and 0 to 20 parts by weight of at least one dye of the formulae III or IV

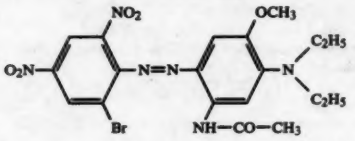


(III)

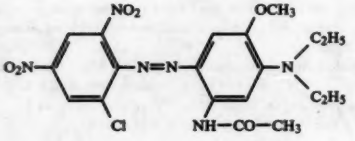


(IV)

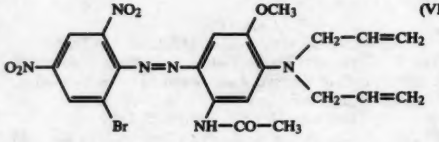
and 20 to 75 parts by weight of at least one dye of the formulae V, VI, VII or VIII



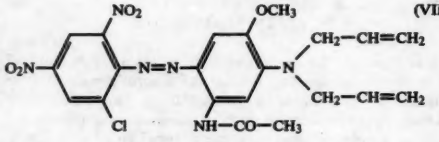
(V)



(VI)



(VII)



(VIII)

wherein the total amount of the respective individual dyes I to VIII, result in 100 parts by weight of the total dye formulation and are based on the content of pure dyestuff.

4,985,045

MIXTURES OF MON-AZO DYESTUFFS FOR DYEING AND PRINTING HYDROPHOBIC SYNTHETIC FIBER MATERIALS

Ulrich Bühler, Schöneck, and Klaus Hofmann, Frankfurt, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

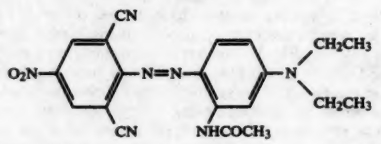
Continuation of Ser. No. 159,482, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 901,992, Aug. 27, 1986, abandoned, which is a continuation of Ser. No. 724,600, Apr. 18, 1985, abandoned, which is a continuation of Ser. No. 528,405, Sep. 1, 1983, abandoned. This application Oct. 30, 1989, Ser. No. 430,086

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1982, 3234186

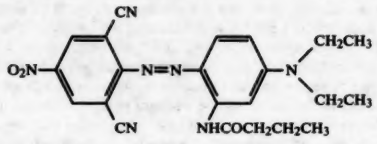
Int. Cl.[5] C09B 27/00, 67/22, 43/00; D06P 1/18

U.S. Cl. 8—639 **3 Claims**

1. A mono azo dyestuff composition for coloring hydrophobic fiber comprising the dye of the formula



and the dye of the formula



in a weight ratio of 50:50 to 30:70.

4,985,046

PROCESS FOR PREPARING POLY (PARAPHENYLENE TEREPHTHALAMIDE) FIBERS DYEABLE WITH CATIONIC DYES

Jon D. Hartzler, Midlothian, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 9, 1989, Ser. No. 363,916
Int. Cl.[5] C09B *44/00*; D06P *3/24*
U.S. Cl. 8—654 **12 Claims**

1. A process for preparing poly(paraphenylene terephthalamide) fibers dyeable with cationic dyes comprising;

(a) soaking poly(paraphenylene terephthalamide) fibers in an 80 to 90% sulfuric acid solution for at least 2 seconds at a temperature in the range from 10° to 50° C.;

(b) washing the acid-soaked fibers with water until substantially all the acid is removed;

(c) contacting the fibers with an aqueous solution comprising 1 to 25% by weight of a solution of at least one of a dye promoting species selected from the group consisting of tetramethylene sulfone, tetramethylene sulfoxide, 1-methyl-2-pyridone, propylene carbonate, 1-methyl-2-pyrrolidinone, dimethylsulfoxide, 1-ethyl-2-pyrrolidinone, 1,3-dimethyl-2-imidazolidinone, glycerol, tetramethylurea and, 1,3-dimethyl-3,4,5,6-tetrahydro-2(1H)-pyrimidinone.

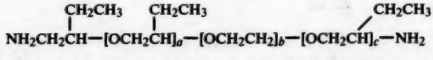
4,985,047

POLY(OXYBUTYLENE)POLY(OXYETHYLENE)DIAMINE COMPOUND AND ORI-INHIBITED MOTOR FUEL COMPOSITION

Rodney L. Sung, Fishkill, and Daniel T. Daly, Brewster, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

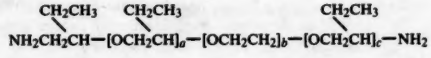
Filed Nov. 24, 1989, Ser. No. 440,638
Int. Cl.[5] C10L *1/22*
U.S. Cl. 44—433 **15 Claims**

1. A polyether diamine compound of the formula:



where b has a value from about 10–80 and a+c has a value from about 12 to 40.

6. A motor fuel composition comprising a mixture of hydrocarbons boiling in the range from about 90° F.–450° F. and from 0.0005–1.0 weight percent of a polyether diamine of the formula:



where b has a value from about 10–80 and a+c has a value from about 12 to 40.

4,985,048

POLYMER MIXTURES FOR IMPROVING THE LOW-TEMPERATURE FLOW PROPERTIES OF MINERAL OIL DISTILLATES

Herbert Wirtz, Eppstein; Michael Feustel, Kelkheim, and Juliane Balzer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 14, 1988, Ser. No. 284,085
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742630
Int. Cl.[5] C10L *1/14, 1/18*
U.S. Cl. 44—394 **5 Claims**

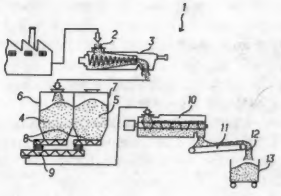
1. A polymer mixture of a copolymer (A_1) made from 10–60% by weight of vinyl acetate and 40–90% by weight of ethylene or a copolymer (A_2) made from 15–50% by weight of vinyl acetate, 0.5–20% by weight of C_6-C_{24}-α-olefin and 30–70% by weight of ethylene, and a copolymer (B) made from 10–90% by weight of C_6-C_{24}-α-olefin and 10–90% by weight of N-C_6-C_{22}-alkylmaleimide, the mixing ratio of copolymers (A_1) or (A_2) to (B) being 100:1 to 1:1.

4,985,049

MANUFACTURING SOLID FUEL

Jung B. Kim, 32-103 Ebiyacho, Oyukichodori, Sanjosagaru, Nakagyo-ku, Kyoto City, Kyoto, Japan

Filed Apr. 18, 1989, Ser. No. 339,830
Int. Cl.[5] B10B *11/00*
U.S. Cl. 44—629 **6 Claims**



1. An apparatus for manufacturing solid fuel from industrial waste comprising:

means for providing dewatered main raw material comprising means for receiving main raw material in the form of a sludge of a combustible material of high calorific content having a high water content, an for providing main raw material having reduced water content;

means for providing auxiliary material;

means for receiving quantities of said dewatered main raw material and said auxiliary material from respective providing means and for kneading said materials together such that a flaky solid fuel is obtained.

4,985,050

SUPPORTED THERMALLY STABLE CUBIC BORON NITRIDE TOOL BLANKS AND METHOD FOR MAKING THE SAME

David B. Cerutti, Worthington, Ohio, assignor to General Electric Company, Worthington, Ohio

Filed Aug. 15, 1989, Ser. No. 394,349
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 **15 Claims**

1. A method for making supported thermally stable cubic boron nitride or wurtzitic boron nitride compacts or wire dies, comprising providing a mass of sinterable cubic boron nitride or wurtzitic boron nitride particles substantially free of catalytic material and a metal-bonded support mass or annulus or a molding powder for in situ formation of a metal-bonded support mass or annulus; positioning a barrier layer between said

mass of sinterable cubic boron nitride or wurtzitic boron nitride particles and said metal-bonded mass or annulus or said molding powder; and subjecting such arrangement of materials to pressure and temperature conditions for a time effective for sintering said cubic boron nitride or wurtzitic boron nitride particles and substantially preventing migration of metal bond material from said support mass or said molding powder into said mass of cubic boron nitride or wurtzitic boron nitride.

4,985,051

DIAMOND COMPACTS

Alfred E. Ringwood, Redhill, Australia, assignor to The Australian National University, Australia

Continuation of Ser. No. 277,598, Nov. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 882,937, Jun. 19, 1986, abandoned. This application Nov. 13, 1989, Ser. No. 436,121

Int. Cl.[5] B24D *3/02*

U.S. Cl. 51—309 7 Claims

1. A diamond compact for cutting, turning, drilling, and otherwise working ultra-hard ceramics, carbides and rocks comprised to 60–95 volume percent of diamond crystals which have been plastically deformed so that they form a closely packed framework structure in which contacts between diamond crystals occur over extended mating surfaces arising from plastic deformation of the diamond crystals during formation of the compact under pressure and temperature conditions within the graphite stability field, the diamond crystals being bonded together by interstitial bonding material comprised of (1) a metal selected from the group consisting of rhenium, rhodium, ruthenium, iridium, osmium and platinum which has accepted carbon from the diamond crystals into solid solution and has formed a bond having a melting point exceeding 1600° C., and (2) a refractory carbide formed by reaction of a metallic bonding agent with carbon in the diamond crystals during formation of the compact under said pressure and temperature conditions, said compacting comprising less than about 2 percent volume of graphite and possessing a compressive strength greater than 10 kbars.

4,985,052

PROCESS FOR PRODUCING HIGH PURITY OXYGEN GAS FROM AIR

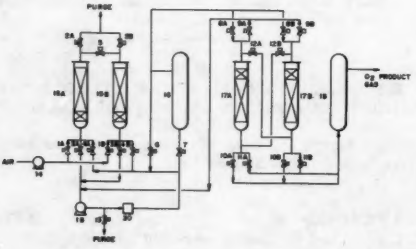
Kazuo Haruna, Kakogawa; Kanji Ueda, Ashiya; Masahiro Inoue, Hyogo, and Hitosi Someda, Kakogawa, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Hyogo, Japan and Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 220,247

Claims priority, application Japan, Aug. 7, 1987, 62-198870

Int. Cl.[5] B01D *53/04*

U.S. Cl. 55—26 2 Claims



1. A process for producing high purity oxygen from air by PSA, with an apparatus comprising: a first adsorption unit packed with carbon molecular sieve; a second adsorption unit packed with zeolite molecular sieve connected in series with the first adsorption unit, each of the units being composed of two adsorbers, and a dehydrant being further packed in the gas inlet of each adsorber; one gas receiver provided between the first and second units for accumulating a desorption gas from the first adsorption unit as well as for introducing the desorption gas to the second unit as a raw material gas and to the first unit as a rinse gas; and one vacuum pump and one refrigerator-type drier at the outlet of the vacuum pump to remove water for desorbing water from each unit, comprising the steps of:

conducting PSA operation separately in each of the units during the same operation cycle time, with effecting a pressure equalization in the first adsorption unit by connecting the adsorber wherein adsorption has been completed to the adsorber wherein desorption has been completed at the outlet thereof as well as effecting a pressure equalization in the second adsorption unit by connecting the outlet of the adsorber wherein adsorption has been completed to the inlet of the adsorber wherein desorption has been completed, and, at the same time, returning a part of the oxygen product gas to the above adsorber of the second adsorption unit wherein desorption has been completed;

accumulating the desorption gas from the first adsorption unit in the receiver and then introducing the resulting desorption gas to the second unit as a raw material gas and to the first unit as the rinse gas, the raw material gas of the second adsorption unit and the rinse gas being initially desorbed gas from the first adsorption unit having an oxygen content of at least 70%; and

desorbing water from each unit under reduced pressure by the vacuum pump and condensed by cooling with the refrigerator-type drier.

4,985,053

GAS SEPARATION MEMBRANE

Kiyoshi Sugie, Iwakuni, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

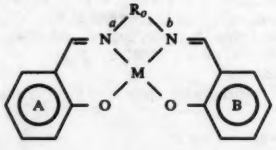
Continuation of Ser. No. 234,084, Aug. 19, 1988, abandoned. This application Feb. 21, 1990, Ser. No. 483,281

Claims priority, application Japan, Aug. 22, 1987, 62-207417; Feb. 6, 1988, 63-24934

Int. Cl.[5] B01D *53/22, 71/36*

U.S. Cl. 55—158 17 Claims

1. A gas separation film comprising a solid permselective layer which is formed by reaction in situ of a Schiff base metal complex compound represented by the following formula (I)



(I)

wherein rings A and B each represent an o-phenylene or o-naphthylene group which may be substituted by at least one group selected from the class consisting of halogen atoms and groups of the formula —X—R in which R represents a saturated or unsaturated aliphatic hydrocarbon group having not more than 22 carbon atoms and X represents a direct bond or a binding member between R and ring A or B, selected from the class consisting of —O—, —COO—, —NHCO— and —S—, R_o represents a hydrocarbon group having not more than 6 carbon atoms in which adjacent carbon atoms or adjacent carbon atoms via one carbon atom are bound to bonds a and b, and M represent a metal selected from the group consisting of Fe, Co, Cu, Ni, Mn, Cr and Zn,

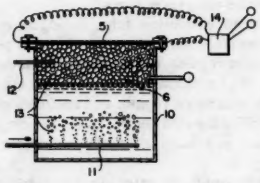
with a polymeric ligand.

4,985,054

FOAM-BURSTING DEVICE

Yoshihiko Shibata; Yoshihiro Chikamori, and Youichi Shimizu, all of Okayama, Japan, assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Dec. 15, 1989, Ser. No. 452,168
Claims priority, application Japan, Dec. 29, 1988, 63-170958[U]
Int. Cl.[5] B01D *19/02*
U.S. Cl. 55—178 1 Claim



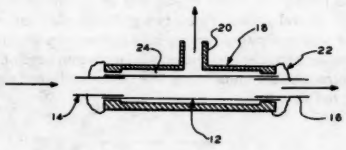
1. A foam-breaking device is characterized by (a) a heater element installed inside two layers of synthetic resin membrane which as been made porous so that said membrane is permeable to gases but impermeable to liquids; said layers being sealed at various places where they are adjacent, such that the heating element is sealed from the environment outside the device.

4,985,055

LIQUID/GAS SEPARATION DEVICE

Jonathan O. Thorne, Englewood, and Christopher T. Crowley, Aurora, both of Colo., assignors to The BOC Group, Inc., New Providence, N.J.

Continuation-in-part of Ser. No. 287,707, Dec. 19, 1988, abandoned, which is a continuation of Ser. No. 71,104, Jul. 7, 1987, abandoned. This application Sep. 18, 1989, Ser. No. 408,647
Int. Cl.[5] B01D *19/00*
U.S. Cl. 55—189 4 Claims



1. A water separator to remove liquid and thereby to draw dry gas from a patient's exhalation for analysis of the dry gas in a gas analyzer, said water separator comprising:

means having an inlet for receiving the patient's exhalation, a liquid outlet for discharging the liquid removed from the patient's exhalation, and a conduit comprising a tubing communicating between said inlet and said liquid outlet and formed of a porous material permeable to the dry gas, but impermeable to the liquid for allowing the dry gas to pass through said porous material and for causing the liquid to remain within said conduit for discharge through said liquid outlet;

chamber means having an inner surface forming a cylindrical, annular chamber around said conduit for collecting the dry gas passed through said porous material and a gas outlet in communication with said cylindrical chamber for discharging the dry gas to the gas analyzer;

said conduit subject to radial expansion upon the patient's exhalation;

said annular chamber having a predetermined, minimum inner diameter sufficient to allow said conduit to expand without contact between said conduit and said inner surface of said chamber means for preventing obstruction of said annular chamber by said conduit and for minimizing the volume of said annular chamber to resist the formation of dead air spaces in said annular chamber;

means for sealing the ends of said annular chamber around said conduit means;

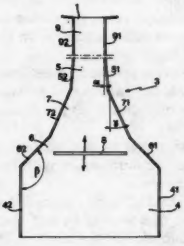
means establishing a negative pressure differential between said annular chamber and the inside of said conduit means for drawing the dry gas through said porous material and out of said gas outlet; and means establishing a negative pressure differential between said liquid outlet, and said inlet for drawing the patient's exhalation into said inlet and for drawing the liquid out of said liquid outlet.

4,985,056

DEVICE FOR PURIFYING CONTAMINATED GAS

Philippe Patte, Nancy, and Andre Cordier, Clamart, both of France, assignors to Air Industrie Systemes, Courbevoie, France

Filed Dec. 7, 1989, Ser. No. 447,462
Claims priority, application France, Dec. 9, 1988, 88 16425
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—240 5 Claims



1. An apparatus for purifying a contaminated gas, particularly for removing paint mist particles from air, comprising, in descending vertical order:

(a) mouth means (2) defining an upper inlet opening (1) for water and contaminated gas,

(b) a downwardly extending, progressively outwardly divergent connecting channel (3) having an upper end coupled to the mouth means at an edge of the inlet opening, and

(c) a downwardly extending lower flow channel (4) having an upper end coupled to a lower end of the connecting channel and a lower end defining an outlet for contaminated water and purified gas, wherein

(d) the connecting channel includes an upstream section (5) having opposing, facing walls (51, 52) converging upwardly at a half-angle α to the vertical between 0° and 10°, and a downstream section (6) having opposite walls (61, 62) individually coupled at lower edges thereof to upper edges of opposite walls (41, 42) defining the lower flow channel at an angle β between 125° and 145°, and

(e) the opposite walls defining the lower flow channel diverge outwardly in a downward direction at an angle of approximately 5° to the vertical, and further comprising

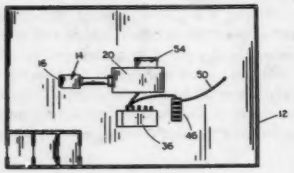
(f) a horizontal water splash shield (8) disposed transversely across the connecting channel at the level of the downstream section thereof.

4,985,057

SUPPLIED AIR RESPIRATOR SYSTEM

Steven C. Griffis, 2929 Avenue D, Council Bluffs, Iowa 51501

Filed Aug. 9, 1989, Ser. No. 391,174
Int. Cl.[5] B01D 46/12
U.S. Cl. 55—269 7 Claims



1. A supplied air respirator system for use in an abatement area, comprising,

an airtight cabinet means in said abatement area having an interior compartment,

said cabinet means having an inlet opening formed therein,

a first air filtration unit positioned in said cabinet means and having an intake side and a discharge side, the intake side of said first air filtration unit being in communication with the inlet opening of said cabinet means,

a second air filtration unit positioned in said cabinet means and having intake and discharge sides, the intake side of said second air filtration unit being in communication with the interior compartment of said cabinet means, said discharge side of said second air filtration unit being in communication with said abatement area,

at least one air pump means in said cabinet means and having intake and discharge sides, the intake end of said air pump means being in communication with the discharge side of said first air filtration unit,

an air cooler means in said abatement area having intake and discharge sides, the intake end of said air cooler means being in communication with the discharge side of said air pump means,

at least one hose means in said abatement area having one end thereof in communication with the discharge side of said air cooler means,

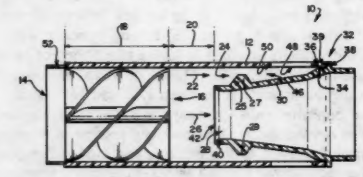
the other end of said air hose means adapted for connection to the air mask of a worker in said abatement area so that cooled air is supplied to the mask of the worker.

4,985,058

VORTEX TUBE SEPARATING DEVICE

Willem J. C. Prinsloo, Pretoria; Pierre De Villiers, Hartbeespoort, and Marten C. Van Dijken, Pretoria, all of South Africa, assignors to Cyclofil (Proprietary) Limited, Pretoria, South Africa

Filed Jun. 1, 1989, Ser. No. 360,067
Claims priority, application South Africa, Jun. 2, 1988, 88/3923; Feb. 14, 1989, 89/1144
The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.
Int. Cl.[5] B01D 45/16
U.S. Cl. 55—457 12 Claims



1. A vortex tube gas cleaning device or particle recovery device suitable for use in treating a particle containing gas flow stream to clean the gas of particles, or to recover particles from the gas, the device comprising

an outer round tube having an inlet at one end which will be an upstream end in use;

an axially arranged vortex or rotating flow generator in the tube downstream of the inlet;

a separation region downstream of the vortex generator;

a peripheral outlet region toward the periphery of the tube downstream of the separation region;

a central outlet region toward the center of the tube downstream of the separation region;

an inner round extraction tube, arranged concentrically within the outer round tube to separate the peripheral and central outlet regions, having an upstream end at a predetermined axial position corresponding to the downstream end of the separation region, said upstream end defining a central orifice for said central outlet region, and a downstream end providing an outlet means for the central outlet region;

outlet means through the outer tube at a predetermined axial position toward a downstream end of the peripheral outlet region;

a concentric locating formation extending annularly between the inner round extraction tube and the outer round tube to interlocate the inner round extraction tube and the outer round tube rigidly and concentrically, the axial position of the concentric locating member being such that it forms a downstream boundary of the peripheral outlet region, and such that the inner round extraction tube extends from the locating formation in an upstream direction canti-lever fashion; and

a peripheral ring extending radially outwardly from the inner round extraction tube spatially downstream of the upstream end of the inner round extraction tube, and having, in series, a diverging annular leading surface, an annular crown, and a converging annular surface defining, respectively, in series, a converging flow contracting portion, an annular scavenge orifice and a diverging flow diffusing portion in the peripheral outlet region, walls bounding the separation region, an upstream portion of said peripheral outlet region and an upstream portion of said central outlet region being continuous and circular and said separation region, said upstream portion of said peripheral outlet region and said upstream portion of said central outlet region being free of circumferentially interrupted structure.

4,985,059

METHOD AND APPARATUS FOR POSITIONING A GLASS SHEET TRAVELING ON A CONVEYOR

Bernard Letemps, Thourotte, and Philippe Dereims, Compiegne, both of France, assignors to Saint-Gorbain Vitrage International, Courbevoie, France

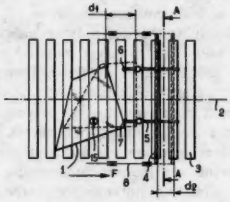
Filed Mar. 19, 1990, Ser. No. 495,638
Claims priority, application France, Mar. 24, 1989, 89 03935
Int. Cl.[5] C03B 35/16
U.S. Cl. 65—62 11 Claims

5. A process for positioning a glass sheet moving on a conveyor, comprising the steps of:

moving stop means along the conveyor in the direction of movement of the glass sheet and at a speed lower than that of the glass sheet, said moving stop means being positioned such that a leading edge of the glass sheet may contact said stop means and be prevented from movement along the conveyor beyond the stop means;

maintaining the leading edge of the glass sheet in contact with the moving stop means for a time period sufficient to

permit the glass sheet to be oriented to a desired orientation; and



permitting the correctly oriented glass sheet to move beyond the stop means.

4,985,060

SOIL CONDITIONERS

Teruo Higa, Ginowan, Japan, assignor to Saken Corporation and Corporation Limited Rioko, both of, Japan

Continuation of Ser. No. 127,512, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 879,951, Jun. 30, 1986, abandoned. This application Oct. 24, 1989, Ser. No. 427,910

Claims priority, application Japan, Jul. 4, 1985, 60-147391; Jul. 5, 1985, 60-147728

Int. Cl.[5] C05F *11/08;* C05G *3/04*

U.S. Cl. 71—6 20 Claims

1. A granular soil conditioner consisting essentially of a porous, air and water permeable, homogeneous mixture of 4 to 4.75 parts by eight finely powdered coal ash, 4 to 4.75 parts by weight finely granulated slag, and 0.5 to 2 parts by weight powdered zeolite, the soil conditioner providing conditions amenable to maintain the microorganisms in a stable, dormant state for ann extended period of time prior to use, the soil conditioner having absorbed in its pores an actinomyceter and a photosynthetic bacterium adapted to compete with microorganisms in the soil harmful to plants or to utilize such plant-harmful microorganisms as a nutrient source and eliminate the plant harming effects of such microorganisms thereby providing plant-useful microorganisms to the soil to promote the growth of a desired crop in the soil to which the soil conditioner is added and wherein the soil conditioner remains unhardened and devoid of hydraulic reaction between the components of the soil conditioner.

4,985,061

PLANT TRANSPLANT AND PLANT PRESERVATION MEDIUM

John Hughes, Arlington Heights, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Division of Ser. No. 926,210, Nov. 3, 1986, Pat. No. 4,906,276. This application Jan. 16, 1990, Ser. No. 466,076

Int. Cl.[5] A01N *3/02*

U.S. Cl. 71—68 12 Claims

1. A method of preserving the life of freshly cut plants comprising insertion of the plant stem into a gel including water and a crosslinked, water absorbent, mixed salt polyacrylate, wherein the cross-linked, water-absorbent, mixed salt polyacrylate is prepared by mixing a monomer solution comprising (A) acrylic acid neutralized 70–100 mole percent with a potassium alkali and an ammonium alkali; (B) styrene in an amount of 0% to 25% based on the weight of acrylic acid and (C) a water-miscible to water-soluble polyvinyl monomer in a combined concentration of (A), (B) and (C) of at least 30 wt.%; with water to form a mixed monomer solution and initiating polymerization of monomers (A), (B) and (C) such that during polymerization, the exothermic heat of reaction is substantially the only heat energy used to accomplish polymerization, crosslinking and to drive off sufficient water to obtain a solid crosslinked resin having a water content of 15 percent by weight or less.

4. A method of preserving the life of freshly cut plants comprising inserting a plant stem into an aqueous gel of sufficient gel strength and rigidity to support the plant stem, said aqueous gel comprising from about 0.02% to about 0.3% by weight of a mixed potassium and ammonium salt of a crosslinked, copolymerized or homopolymerized acrylate, wherein a cross-linked, copolymerized or homopolymerized acrylate is prepared by mixing a monomer solution comprising (A) acrylic neutralized 70–100 mole percent with a potassium alkali and an ammonium alkali; (B) styrene in an amount of 0% to 25% based on the weight of acrylic acid and (C) a water-miscible to water-soluble polyvinyl monomer in a combined concentration of (A), (B) and (C) of at least 30 wt. %; with water to form a mixed monomer solution and initiating polymerization of monomers (A), (B) and (C) such that during polymerization, the exothermic heat of reaction is substantially the only heat energy used to accomplish polymerization, crosslinking and to drive off sufficient water to obtain a solid crosslinked resin having a water content of 15 percent by weight or less.

4,985,062

METHOD OF IMPROVING CROP YIELD

John Hughes, Arlington Heights, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Continuation-in-part of Ser. No. 926,210 Nov. 3, 1986, Pat. No. 4,906,276. This application Aug. 17, 1989, Ser. No. 394,958

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[5] A01N *33/00*

U.S. Cl. 71—77 7 Claims

1. A method of increasing the yield of crops comprising contacting a plant root with an aqueous gel comprising from about 0.4% to about 0.7% by weight of a mixed potassium and ammonium salt of a crosslinked, copolymerized or homopolymerized acrylate and covering the plant root and the aqueous gel with soil; wherein the mixed potassium and ammonium salt of a crosslinked, copolymerized or homopolymerized acrylate is prepared by mixing a monomer-solution of (A) acrylic acid neutralized 70 100 mole percent with a potassium alkali and an ammonium alkali; (B) styrene in an amount of 0% to 25% based on the weight of acrylic acid and (C) a water-miscible to water-soluble polyvinyl monomer in a combined concentration of (A), (B) and (C) of at least 30 wt. %; with water to form a mixed monomer-solution and initiating polymerization of monomers (A), (B) and (C) such that during polymerization, the exothermic heat of reaction is substantially the only heat energy used to accomplish polymerization, cross linking and to drive off sufficient water to obtain a solid crosslinked resin having a water content of 15 percent by weight or less.

4,985,063

3-ARYL-PYRROLIDINE-2,4-DIONES

Reiner Fischer, Monheim; Hermann Hagemann, Leverkusen; Andreas Krebs, Odenthal-Holz; Albrecht Marhold, Leverkusen; Klaus Lürssen; Robert R. Schmidt, both of Bergisch-Gladbach; Hans-Joachim Santel, Leverkusen; Benedikt Becker, Mettmann; Klaus Schaller, and Wilhelm Stendel, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

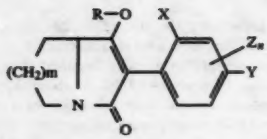
Filed Aug. 8, 1989, Ser. No. 391,227

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1988, 3828404; Sep. 20, 1988, 3831852; Apr. 26, 1989, 3913682

Int. Cl.[5] C07D *471/02, 487/04;* A61K *31/485, 31/40*

U.S. Cl. 71—88 6 Claims

1. A compound of the formula (I)



(I)

in which
X represents alkyl and halogen,
Y represents hydrogen, alkyl, halogen and halogenoalkyl,
Z represents alkyl and halogen,
m represents a number from 1–4,
n represents a number from 0–3,
R represents hydrogen, —COR[1],

or A, where
A represents a metal cation equivalent or represents an ammonium ion.
R[1] represents a metal cation equivalent or represents an ammonium ion,
R[1] represents unsubstituted or halogen-substituted alkyl, alkenyl, alkoxyalkyl, alkythioalkyl, polyalkoxyalkyl and unsubstituted cycloalkyl having 3 to 8 ring atoms and being uninterrupted by hetero atoms or being interrupted in the ring by oxygen and/or sulfur, or R[1] represents unsubstituted phenyl or phenyl substituted by halogen, nitro, C_1–C_6-alkyl, C_1–C_6-halogenoalkoxy or C_1–C_6-halogenoalkyl, unsubstitued phenylalkyl or phenyalkyl substituted by halogen, C_1–c_6-alkyl, C_1–C_6-alkoxy, C_1–C_6-halogenoalkyl or C_1–C_6-halogenoalkoxy, unsubstituted pyridyl, pyrimidyl, thiazolyl or pyrazolyl, or pyridyl, pyrimidyl, thiazolyl or pyrazolyl substituted by halogen or C_1–C_6-alkyl and unsubstituted or halogen, amino or C_1–C_6-alkyl-substituted pyridyloxy-C_1–C_6-alkyl, pyrimidyloxy-C_1–C_8-alkyl or -thiazolyloxy-C_1–C_6-alkyl, and
R[2] represents unsubstituted or halogen-substituted alkyl, cycloalkyl, alkenyl, alkoxyalkyl, polyalkoxyalkyl and unsubstituted phenyl or phenyl substituted by halogen, C_1–C_6-alkyl, C_1–C_6-alkoxy or C_1–C_6-halogenoalkyl, as well as the pure enantiomeric forms of the compounds of the formula (I).

5. An insecticidal and/or acaricidal and/or herbicidal composition comprising an insecticidal and/or acaricidal and/or herbicidal effective amount of at least one compound of the formula (I) according to claim 1 in admixture with a diluent.

4,985,064

MICROSUSPENSION PROCESS FOR PREPARING SOLVENT CORE SEQUENTIAL POLYMER DISPERSION

George H. Redlich, Norristown, and Ronald W. Novak, Chalfont, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 728,992, Apr. 30, 1985, Pat. No. 4,677,003. This application Dec. 16, 1986, Ser. No. 942,312
Int. Cl.[5] A01N *43/02*; B01J *13/18*; C08F *265/04*
U.S. Cl. 71—90 **30 Claims**

1. A process for encapsulating at least one organic target material in water-insoluble core/shell particles comprising
(a) preparing core emulsion by emulsifying in water at high shear constituents comprising
(1) organic target material to be encapsulated,
(2) at least one hydrophilic solvent,
(3) initial monomer comprising at least two polymerizable mono-alpha, beta-ethylenically unsaturated compounds wherein said initial monomer includes from about 2 to 4 percent by weight, based on total weight of said initial monomer, of alpha, beta-ethylenically unsaturated carboxylic acid monomer,
(4) hydrophobic anionic surfactant,
(5) water-insoluble emulsion stabilizer,
(6) water-insoluble thermal polymerization initiator, and wherein said organic target material and hydrophilic solvents are non-solvents for polymer prepared by polymerizing said initial monomer,
(b) heating said core emulsion to polymerize said initial monomer thereby forming core particles, and
(c) adding at least one base selected from the group consisting of ammonia and the non-nucleophilic organic amines thereby neutralizing polymerized carboxylic acid and forming core/shell particles.

30. A sprayable agricultural herbicide composition comprising herbicidally effective target material encapsulated according to the process of claim 1.

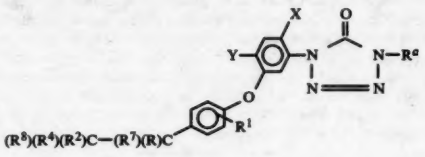
4,985,065

TETRAZOLINONE HERBICIDES

George Theodoridis, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed May 10, 1989, Ser. No. 349,610
Int. Cl.[5] C07D *257/04*; A01N *43/713*
U.S. Cl. 71—92 **27 Claims**

1. A herbicidal compound of the formula



in which
R^a is alkyl, haloalkyl, or alkenyl;
X is H, halogen, alkyl, or haloalkyl;
Y is H, halogen, alkyl, alkoxy, alkylthio, haloalkyl, —$SOCF_3$, or haloalkoxy;
R^1 is H, alkyl, halogen, haloalkyl, nitro, alkoxy, alkylthio, or CN;
R is H, alkyl, halogen, or alkoxy;
R^7 is H or alkyl;
R^2 is H, alkyl, alkenyl, alkynyl, halogen, CN, COR^3; or R^2 together with R constitutes a double bond;
R^4 is H, halogen, alkyl, alkenyl, or alkynyl;
R^8 is CN or COR^3; and
R^3 is OH, alkoxy, alkenyloxy, alkynyloxy, alkoxyalkoxy, alkenyloxyalkoxy, alkynyloxyalkoxy, amino, phenylamino, alkylamino, alkenylamino, alkoxyamino, alkoxycarbonyl substituted alkoxyamino, —$NHSO_2R^5$ in which R^5 is alkyl, haloalkyl, phenyl, halophenyl or alkoxyphenyl, or —OZ^2 where Z^2 is a monovalent salt-forming cation; and
in which each occurrence of the terms alkyl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkynyloxy, including prefixes and suffixes, have up to six carbon atoms.

4,985,066

2-PHENOXYPYRIMIDINE DERIVATIVE AND HERBICIDAL COMPOSITION

Nobuhide Wada; Yoshihiro Saito, both of Shizuoka; Shoji Kusano, Hamamatsu; Yasuhumi Toyokawa; Takeshige Miyazawa, both of Shizuoka; Ikuo Kajiwara, Nagaokakyo, and Satoru Takahashi, Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 291,353, Dec. 29, 1988, Pat. No. 4,900,352, which is a continuation of Ser. No. 37,323, Apr. 13, 1987, abandoned. This application Nov. 24, 1989, Ser. No. 440,783

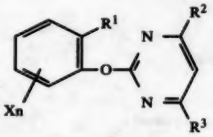
Claims priority, application Japan, Jun. 6, 1986, 61-131285

The portion of the term of this patent subsequent to Sep. 13, 2006, has been disclaimed.

Int. Cl.[5] A01N *43/54*; C07D *239/28*

U.S. Cl. 71—92 14 Claims

1. A 2-phenoxypyrimidine derivative having the formula:



(A)

wherein R^1 is a formyl group, a dimethoxymethyl group or —COOR[4], wherein R^4 is a hydrogen atom, a lower alkyl group, a benzyl group, an alkali metal atom, an alkaline earth metal atom or an organic ammonium group, R^2 is a chlorine atom, a methyl group, a methoxy group or a difluoromethoxy group, R^3 is a methyl group or a methoxy group, X is a halogen atom, a lower alkyl group, a lower alkoxy group, an amino group, a hydroxyl group, a nitro group or a cyano group, and n is 1 or 2, with the proviso that when R^4 is hydrogen, lower alkyl or benzyl, both of Groups R^2 and R^3 can not be methoxy and X can not be lower alkyl, lower alkoxy, halogen or nitro.

14. A method for killing weeds which comprises applying a herbicidally effective amount of a 2-phenoxypyrimidine derivative as defined in claim 1 to a locus to be protected.

4,985,067

PROCESS AND DEVICE FOR IMPLEMENTING HOT CHEMICAL PROCESSES

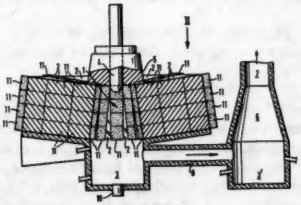
Wilhelm Stadlbauer, deceased, late of Alkoven, Austria by Herta Stadlbauer, Wolfram Stadlbauer, Helmut Stadlbauer ; Erwin Koch, Leonding, Austria; Franz Zauner, Linz, Austria; Rudolf Rinesch, Linz, Austria, and Wolfgang Vanovsek, Leoben, all of Austria, assignors to K.H.T. Know-How-Trading Patent Verwetung GmbH, Vienna, Austria

Filed Mar. 17, 1989, Ser. No. 314,062

Claims priority, application Austria, May 18, 1987, 1258/87

Int. Cl.[5] H05B *7/00*; C22B *4/00*

U.S. Cl. 75—10.1 16 Claims



1. Method for melting or melt reducing chemical mixtures at working temperatures which exceed the melting temperature of highly refractory linings, comprising the steps of pressing the chemical mixture into bars, arranging the bars to form cavern having a defined geometry, the cavern surrounding a centrally located high, energy density radiation source, a portion of the bars facing the radiation source melting at a melting rate and maintaining the cavern geometry by radially advancing the bars toward the radiation source at a rate which is the same as the melting rate.

4,985,068

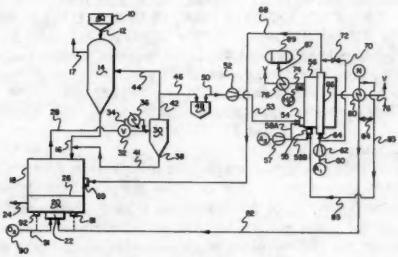
METHOD AND APPARATUS FOR SMELTING IRON OXIDE

Glenn E. Hoffmann, Pineville, N.C., and John C. Scarlett, Toledo, Ohio, assignors to Midrex International BV, Rotterdam, Zurich Branch, Zurich, Switzerland

Filed Nov. 27, 1989, Ser. No. 441,823

Int. Cl.[5] C22B *4/00*

U.S. Cl. 75—501 37 Claims



1. A method for smelting reduction of iron oxide, comprising:

(a) feeding prereduced iron oxide into an enclosed smelter;

(b) heating, melting and reducing said iron oxide to molten metal by combusting an excess of natural gas with oxygen, carburizing the molten metal by dissolving dissociated carbon in the metal, and forming a reacted off-gas;

(c) introducing hot air into the enclosed smelter above the molten bath and oxidizing a portion of the off-gas to produce a flue gas;

(d) cleaning and cooling said flue gas to a temperature of from about 800° to 950° C.;

(e) contacting said iron oxide with said cleaned flue gas to perform the prereducing function; and

(f) drawing off molten iron product.

4,985,069

INDUCTION SLAG REDUCTION PROCESS FOR MAKING TITANIUM

Davis E. Traut, Corvallis, Oreg., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sep. 15, 1986, Ser. No. 907,341

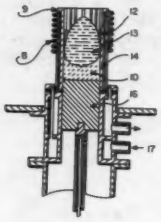
Int. Cl.[5] C22B *34/00*

U.S. Cl. 75—10.18 11 Claims

1. A continuous process for the recovery of titanium from a titanium ore comprising:

(a) contacting said ore with a fluorinating agent selected from the group consisting of alkaline earth metal fluorides

and alkaline earth metal fluosilicates to form a fluotitanate, and



(b) reducing the said fluotitanate with an alkaline earth metal under molten conditions, to produce said titanium.

4,985,070

HIGH STRENGTH NITROGEN-CONTAINING CERMET AND PROCESS FOR PREPARATION THEREOF

Kozo Kitamura; Takeshi Saitoh; Mitsuo Ueki, and Keiichi Kobori, all of Kawasaki, Japan, assignors to Toshiba Tungaloy Co., Ltd., Kawasaki, Japan

Filed Jul. 21, 1989, Ser. No. 383,060

Claims priority, application Japan, Nov. 29, 1988, 63-300114

Int. Cl.[5] C22C *29/04*

U.S. Cl. 75—238 18 Claims

1. A high strength nitrogen-containing cermet comprising 7 to 20% by weight of a binder phase composed mainly of Co and/or Ni, with the balance being a hard phase composed mainly of titanium carbide, titanium nitride and/or titanium carbonitride and inevitable impurities, wherein said hard phase comprises 35 to 59% by weight of titanium (Ti), 9 to 29% by weight of tungsten (W), 0.4 to 3.5% by weight of molybdenum (Mo), 4 to 24% by weight of elements selected from the group consisting of tantalum (Ta), niobium (Nb), vanadium (B) and zirconium (Zr), 5.5 to 9.5% by weight of nitrogen (N) and 4.5 to 12% by weight of carbon (C) wherein the cermet includes (1) at least one of Ta and Nb and (2) at least one of Zr and a mixture of V and Zr, the weight ratio of (1):(2) being in the range of 70–98:30–2.

4,985,071

PROCESS FOR PRODUCING A BASE METAL THIN FILM AND AN ELECTRONIC DEVICE USING THE SAME

Munehiro Tabata, Ibaraki; Chiharu Hayashi, Hirakata; Yasuhito Isozaki, Neyagawa; Kazuyuki Okano, Katano, and Yo Hasegawa, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP88/00478, § 371 Date Jan. 12, 1989, § 102(e) Date Jan. 12, 1989, PCT Pub. No. WO88/09395, PCT Pub. Date Dec. 1, 1988

PCT Filed May 20, 1988, Ser. No. 298,889

Claims priority, application Japan, May 20, 1987, 62-122948; Aug. 26, 1987, 62-211999

Int. Cl.[5] B22F *9/00*

U.S. Cl. 75—246 9 Claims

1. A process for producing a base metal thin film which comprises forming on a substrate a layer of an organic compound containing a base metal in the molecular structure, thermally decomposing the organic compound layer containing the base metal in the molecular structure in oxidative atmosphere into the oxide of the base metal, and then heat-treating the base metal oxide in reductive atmosphere.

4,985,072

POLYCRYSTALLINE MAGNETIC SUBSTANCES FOR MAGNETIC REFRIGERATION AND A METHOD OF MANUFACTURING THE SAME

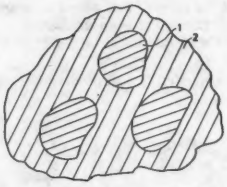
Masashi Sahashi, Yokohama; Hiromi Niu, Tokyo, and Koichiro Inomata, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 912,505, Sep. 29, 1986, abandoned. This application Sep. 22, 1988, Ser. No. 248,286

Claims priority, application Japan, Sep. 30, 1985, 60-214617; Apr. 15, 1986, 61-86611

Int. Cl.[5] B22F *9/00*; C22C *5/00*

U.S. Cl. 75—246 22 Claims



1. A magnetic refrigerant comprised of a polycrystalline magnetic substance comprising

a plurality of magnetic alloy fine crystalline particles that comprise at least one rare-earth element selected from the group of Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, and Yb, and the remainder comprising at least one metal selected from the group consisting of Al, Ni, Co, and Fe; and

a metallic binder for forming a compact together with said fine crystalline particles, the abundance ratio of said metallic binder in the compact being 1 to 80% by volume.

4,985,073

NEEDLE SHAPED ALLOY POWDERS BASED ON IRON AND THEIR USE

Rolf Naumann; Jakob Rademachers, both of Krefeld, and Fritz Rodi, Moers, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jul. 25, 1989, Ser. No. 384,432

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1988, 3826770

Int. Cl.[5] H01F *1/147*

U.S. Cl. 75—255 4 Claims

4. In an improved magnetic recording device which contains magnetic powders as the magnetic recording means, the improvement comprising said powder being needle shaped alloy pigment particles consisting essentially of iron, 1.5 to 3.5% by weight silicon and 1 to 4.5% by weight aluminum, with up to 1.0% by weight of chromium and one or both of cobalt or tin in amounts from 0.3 to 3% by weight of cobalt and from 0.1 to 5.0% by weight of tin, based in each case on the iron.

4,985,074

PROCESS FOR PRODUCING A DESULFURIZATION AGENT

Osamu Okada, Osakasayama; Susumu Takami, Osaka; Tamotu Kotani, Soraku; Satoshi Mori, Fujiidera; Hiroki Fujita, Nishinomiya; Naoko Fukumura, Fujiidera, and Masamichi Ippommatsu, Nishinomiya, all of Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

Filed Oct. 31, 1988, Ser. No. 264,313

Claims priority, application Japan, Nov. 5, 1987, 62-279867; Nov. 5, 1987, 62-279868

Int. Cl.[5] C22B *1/00*; C22C *1/04*

U.S. Cl. 75—444 13 Claims

1. A process for producing a desulfurization agent which comprises:

(a) mixing an aqueous solution having dissolved therein a copper compound and a zinc compound with an aqueous alkali solution to neutralize the mixture and to form a copper compound-zinc compound coprecipitate,

(b) calcining the coprecipitate to obtain a copper oxide-zinc oxide mixture, and

(c) reducing the mixture in the presence of hydrogen.

4,985,075

METHOD FOR MANUFACTURING CHROMIUM-BEARING PIG IRON

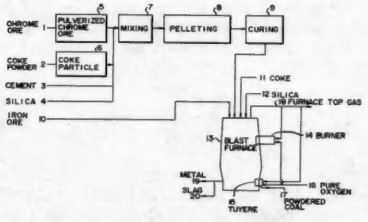
Yotaro Ohno; Masahiro Matsuura; Kenkichi Sato, and Hiroshi Fukuyo, all of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 36,565, Apr. 9, 1987, abandoned. This application Jan. 12, 1989, Ser. No. 296,873

Claims priority, application Japan, Jun. 10, 1986, 61-134622

Int. Cl.[5] C21B *5/02*

U.S. Cl. 75—460 17 Claims



17. The method for producing chromium-bearing pig iron in a blast furnace which comprises:

preparing bonded pellets from powdered chromium ore, powdered coke and flux materials;

introducing into a blast furnace a cold charge of said bonded pellets together with iron ore and coke lumps to form a burden in said blast furnace, said charge being proportioned in terms of Cr and Fe to yield a chromium-bearing pig iron;

blowing a preheating gas at a temperature of from 1000° to 1600° C. into said burden at the middle level of said blast furnace to preheat said burden; and

blowing a gas containing more than 50% oxygen through the tuyeres of said blast furnace at a controlled flame temperature between 2000° and 2900° C.,

to produce chromium-bearing pig iron while yielding a furnace top gas low in nitrogen.

4,985,076

AUTOCATALYTIC ELECTROLESS GOLD PLATING COMPOSITION

Charles D. Iacovangelo, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 3, 1989, Ser. No. 431,358

Int. Cl.[5] C09D *1/00*

U.S. Cl. 106—1.26 17 Claims

1. An aqueous autocatalytic electroless gold plating composition comprising about 0.002 to about 0.05M of a water-soluble alkali metal monovalent gold cyanide complex, about 0.01 to about 0.1M of a water-soluble cyanide compound, about 0.1 to about 0.1M of a carbonate compound, about 0.1 to about 0.45 M of an aliphatic amine, and about 0.01 to about 0.1M of a reducing agent selected from the group consisting of water soluble alkali metal borohydrides and water soluble amine boranes, the plating composition having a pH within the range of about 10–14.

4,985,077

WATERCOLOR INK

Osao Ise, Kakogawa; Hideto Kanazawa, Yokohama, and Masahiko Ishida, Fujisawa, all of Japan, assignors to Taiho Industries Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 339,593

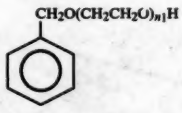
Claims priority, application Japan, Apr. 19, 1988, 63-94581; Aug. 3, 1988, 63-192842

Int. Cl.[5] C09D *11/00*

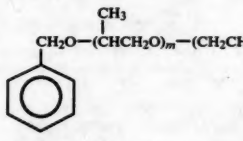
U.S. Cl. 106—22 2 Claims

1. A watercolor ink, comprising:

a water-soluble dye; water; 1.0–20% by weight, based on the total amount of said watercolor ink of a benzyl ether of the formula:



wherein n_1 is an integer within the range of 3–15, or the formula:



wherein m is an integer within the range of 1–15 and n_2 is 0 or an integer in the range of 1–14, provided that $1 \leqq m+n_2 \leqq 15$ is satisfied; a water-soluble organic solvent; and 0.1 to 10.0% by weight of a second solvent containing an OH group in its molecular unit and being insoluble or sparingly soluble in water.

4,985,078

THERMOSTABLE ZINC FERRITE COLOR PIGMENTS CONTAINING 0.05–0.5 WT % LITHIUM, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Jakob Rademachers, Krefeld; Volker Wilhelm, Bergisch-Gladbach; Siegfried Keifer, and Wilfried Burow, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 357,999

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1988, 3819626

Int. Cl.[5] C04B *35/26*; C09C *1/04*, *1/22*, *1/62*

U.S. Cl. 106—419 4 Claims

1. Zinc ferrite color pigments containing from 0.05 to 0.5% by weight of lithium.

4,985,079

OPEN-GRADED ASPHALT EMULSION MIXES

Peter E. Graf, Orinda; Steven J. Agazzi, Walnut Creek, and Eugene J. Vanderzanden, Piedmont, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 926,035, Oct. 31, 1986, Pat. No. 4,822,427. This application Apr. 5, 1989, Ser. No. 334,017

Int. Cl.[5] C09D *3/387, 3/24*

U.S. Cl. 106—502 21 Claims

1. A medium set cationic bituminous emulsion comprising, relative to the emulsion:

a. about 40 to 75% by weight asphalt;

b. 0.25 to 5% by weight of a cationic emulsifier;

c. 0.1 to 0.5% by weight of a nonionic water-soluble thickening agent;

d. 0 to 8% of a low-boiling hydrocarbon; and

e. water as a continuous phase of said emulsion to make up 100% by weight;

wherein said medium set emulsion when combined with open-graded aggregate/produces a mix which has a thick coating of emulsion on said aggregate surface and said mix is workable and has a minimum runoff of less than 10 percent of the total emulsion added to said aggregate.

4,985,080

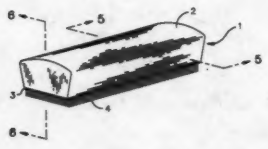
DRY MORTAR MIXTURE

Fritz Jung, Vienna, Austria, assignor to Allgemeine Baugesellschaft-A.Porr Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 96,351, Aug. 10, 1987, abandoned. This application Oct. 4, 1989, Ser. No. 418,816

Int. Cl.[5] C03C *7/00*

U.S. Cl. 106—672 37 Claims



1. A dry mortar mixture for preparing a corrosion resistant coating on surfaces of concrete structures, consisting essentially of:

at least one inorganic bonding material selected from the group consisting of cement, lime and mixtures thereof;

from about 2 to 75 weight % relative to the weight of said dry mortar mix of a coarse grain size portland cement clinker;

from about 1 to 60 weight % relative to the weight of said dry mortar mix of a plastic in powder form, adapted to be dispersed or dissolved in liquid, said plastic having a T_{max} value of less than −5° C.; and

an effective amount of a pore forming additive to increase resistance to frost or ice-melting salts.

4,985,081

METHOD OF PRODUCING CEMENT OR CONCRETE

Heikki Ahonen, Valkeakoski; Timo Kenakkala, Tampere, and Pertti Kokkonen, Kempele, all of Finland, assignors to Oy Iampella AB, Tampere, Finland

Filed Feb. 28, 1990, Ser. No. 486,403

Claims priority, application Finland, Mar. 17, 1989, 891284

Int. Cl.[5] C04B *11/00*

U.S. Cl. 106—772 20 Claims

1. A method of producing cement or concrete, utilizing fly ash containing calcium sulphite and reaction products from the reaction occurring between lime and sulphur oxides in connection with the desulphurization of flue gases, and utilizing hydrogen peroxide, comprising the steps of:

(a) at the cement or concrete production stage, adding the fly ash containing calcium sulphite and reaction products to the cement or concrete; and

(b) adding hydrogen peroxide so as to effect oxidation of the calcium sulphite into calcium sulphate;

the amount of fly ash containing calcium sulphite and reaction products, and hydrogen peroxide, added being an effective amount of each to obtain strength values of the concrete or cement produced substantially equal to or better than those of conventional cement or concrete containing pure fly ash.

4,985,082

MICROPOROUS GRANULAR STARCH MATRIX COMPOSITIONS

Roy L. Whistler, West Lafayette, Ind., assignor to Lafayette Applied Chemistry, Inc., West Lafayette, Ind.

Filed Nov. 20, 1987, Ser. No. 123,570

Int. Cl.[5] C08B *31/00, 31/02, 31/08*

U.S. Cl. 127—33 4 Claims

1. A starch matrix material for releasable containment of an absorbate, said matrix material comprising starch granules partially hydrolyzed with amylase in an aqueous medium at a temperature below the gelatinization point of said granules to produce microporous starch granules, said microporous starch granules being additionally contacted with a solution of a surface modifying agent effective to enhance compatibility of the surfaces of said microporous starch granules with said absorbate, the surface modifying agent being selected from the group consisting of methylcellulose, carboxymethylcellulose, polyvinyl alcohol, poly-N-vinyl-2-pyrrolidone, polyacrylamide, a starch reactive etherifying agent and a starch reactive esterifying agent.

4,985,083

METHOD FOR DECONTAMINATING A MATERIAL AND AN ASSEMBLY FOR CARRYING OUT SAID METHOD

Dennis Sogaard, Svendborg, Denmark, assignor to A/S Phonix Contractors, Vejen, Denmark

Filed Jan. 4, 1989, Ser. No. 293,433

Claims priority, application Denmark, Jan. 5, 1988, 0018/88

Int. Cl.[5] B08B *3/08*

U.S. Cl. 134—26 12 Claims

1. A method for decontaminating a material comprising

(1) charging the contaminated material into a container having means for introducing and distributing steam and liquid as well as means for removing fluids,

(2) introducing steam and removing fluids including some contaminants,

(3) extracting the material by introducing an extractant and removing the remaining water, extractant and contaminants,

(4) stripping the extracted material with steam, and

(5) removing the decontaminated, dry or slightly humid material from the container.

4,985,084
TWO-LAYER PAPER MACHINE FABRIC

Merja Hakkarainen, Juankoski, and Seppo Taipale, Siilinjärvi, both of Finland, assignors to Tamfelt Oy AB, Tampere, Finland

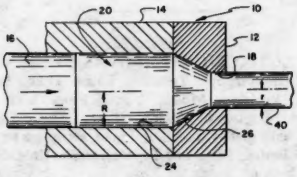
Filed Jul. 9, 1990, Ser. No. 550,010
Claims priority, application Finland, Jun. 15, 1990, 903024
Int. Cl.[5] D03D *23/00*
U.S. Cl. 139—383 A 2 Claims

1. A two-layer paper machine fabric comprising one machine direction yarn system and two crossmachine direction yarn systems of which the upper cross-machine direction yarn system is positioned on the paper contacting side of the fabric and the lower cross-machine direction yarn system on the machine contacting side of the fabric, all the yarn systems being interlaced in accordance with an 8-shaft weave repeat, and the yarns of the cross-machine direction yarn systems being positioned in two layers in such a way that the number of yarns in the upper system is double as compared with the lower cross-machine direction yarn system, whereby each machine direction yarn passes during one weave repeat over two yarns in the upper cross-machine direction yarn layer and under one yarn in the lower cross-machine direction yarn layer, and the passage of each machine direction yarn being reverse as compared with the passages of adjacent yarns; the yarns of the upper cross-machine direction yarn system form floats extending alternately over two and four machine direction yarns on the paper contacting side of the fabric and the yarns of the lower cross-machine direction yarn system form floats extending alternately over two and four machine direction yarns on the machine contacting side of the fabric in such a way that the longer float of the upper cross-machine direction yarn is always in alignment with the shorter float of the lower cross-machine direction yarn, and vice versa.

4,985,085
METHOD OF MAKING ANISOTROPIC MAGNETS

Dilip K. Chatterjee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 23, 1988, Ser. No. 159,636
Int. Cl.[5] B22F *3/00*
U.S. Cl. 148—101 4 Claims

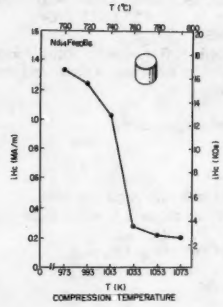


1. A method of making anisotropic permanent magnets which comprises providing a neodymium-iron-boron alloy having a grain size of from about 500 Å to about 2000 Å and extruding said alloy at a temperature of from about 600° C. to about 1000° C. at an extrusion ration of from about 10:1 to about 26:1.

4,985,086
METHOD AND APPARATUS FOR PRODUCING MAGNETICALLY ANISOTROPIC ND-FE-B MAGNET MATERIAL

Katsunori Iwasaki; Yasuto Nozawa, both of Kumagaya, and Shigeho Tanigawa, Konosu, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation of Ser. No. 112,876, Oct. 27, 1987, abandoned.
This application Jun. 2, 1989, Ser. No. 361,685
Claims priority, application Japan, Sep. 10, 1987, 62-227387
Int. Cl.[5] H01F *1/02*
U.S. Cl. 148—101 14 Claims



1. A method of producing a magnetically anisotropic Nd-Fe-B magnetic material comprising the steps of:

forming a green body consisting of an amorphous alloy material and/or a finely crystallized alloy material represented by the formula (in at %):

$$(Nd_{1-x}A_x)_{11-18}(Fe_{1-y}Co_y)_{bal}B_{4-11}M_z$$

wherein $0 \leqq x \leqq 1$, $y \leqq 0.3$, $z \leqq 3$, M represents one or more elements other than Nd, Dy, Pr, Fe, Tb, Co and B, and A represents one or more elements selected from Dy, Pr and Tb, and having an average crystal grain size of 0.01–0.5 μm;

pressing said green body using die means while keeping the temperature thereof (pressing temperature) at 600°–850° C., to produce a pressed green body said pressed green body having a thickness measured along the direction of pressing;

maintaining continuously the temperature of said pressed green body at 600°–850° C.; and

upsetting the entirety of said temperature maintained pressed green body to reduce the thickness of the material relative to the pressed green body thickness, using die means while keeping the temperature (upsetting temperature) at 600°–850° C. to provide it with magnetic anisotropy,

wherein said forming step includes the step of pre-pressing flakes of powder of the alloy material,

wherein the same die means is used for both said pressing and said upsetting steps,

and wherein the temperature of said material is maintained between about 600°–850° C. from the beginning of said pressing step to the end of said upsetting step.

4,985,087
TREATING ZINCIFEROUS METAL SURFACES TO BLACKEN THEM

Kazuhiko Mori; Hitoshi Ishii, and Toshi Miyawaki, all of Kanagawa, Japan, assignors to Nihon Parkerizing Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 389,071
Int. Cl.[5] C23C *22/60, 22/68, 30/00*
U.S. Cl. 148—273 12 Claims

1. A process for treating a zinc surface, comprising contact-

ing the zinc surface, for a time sufficient to blacken the surface with a treating liquid that is an alkaline aqueous solution which has a pH between about 7 and about 11.0 and consists essentially of at least about 1.0 g/L of Ni^{2+} ions and sufficient NH_3 to give a molar ratio of NH_3 to Ni^{2+} ions in the treating solution of at least about 6.

4,985,088

FE-BASED SOFT MAGNETIC ALLOY PRODUCT

Masami Okamura, and Takao Sawa, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 17, 1989, Ser. No. 353,031

Claims priority, application Japan, May 17, 1988, 63-118332

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—305 **11 Claims**

1. An Fe-based, soft magnetic alloy having fine crystal grains dispersed in an amorphous phase and conforming to the following formula:

$$(Fe_{1-a-b}Cu_aM_b)_{100-c}Y_c$$

where

"M" is at least one rare earth element;

"Y" is at least one element selected from the group consisting of Si, B, P, and C; and

wherein "a" and "b" are as follows:

$$0.005 \leqq a \leqq 0.05$$

$$0.005 \leqq b \leqq 0.1$$

and "c", expressed in atomic %, is as follows:

$$15 \leqq c \leqq 28.$$

4,985,089

FE-BASE SOFT MAGNETIC ALLOY POWDER AND MAGNETIC CORE THEREOF AND METHOD OF PRODUCING SAME

Yoshihito Yoshizawa, and Kiyotaka Yamauchi, both of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

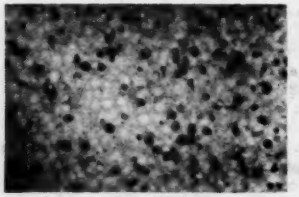
Filed Jul. 25, 1988, Ser. No. 223,842

Claims priority, application Japan, Jul. 23, 1987, 62-183878

The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.

Int. Cl.[5] H01F *1/147*

U.S. Cl. 148—303 **15 Claims**



10. An Fe-base soft magnetic alloy dust core composed of compressed Fe-base soft magnetic alloy fine powder, said Fe-base soft magnetic alloy having the composition represented by the general formula:

$$(Fe_{1-a}M_a)_{100-x-y-z-\alpha-\beta-\gamma}Cu_xSi_yB_zM'_\alpha M''_\beta M_\gamma$$

wherein M is Co and/or Ni, M' is at least one element selected from the group consisting of Nb, W, Ta, Zr, Hf, Ti and Mo, M'' is at least one element selected from the group consisting of V, Cr, Mn, Al, elements in the platinum group, Sc, Y, rare earth elements, Au, Zn, Sn and Re, X is at least one element selected from the group consisting of C, Ge, P, Ga, Sb, In, Be and As, and a, x, y, z, α, β and Y respectively satisfy $0<a<0.5$, $0.1<x<3$, $0<y<30$, $0<z<25$, $0<y+z<35$, $0.1<\alpha<30$, $0<\beta<10$ and $0<\gamma<10$, at least 50% of the alloy structure being fine crystalline particles having an average particle size of 500 Å or less.

4,985,090

NON-AGEING LOW-ALLOY HOT-ROLLED STRIP-FORM FORMABLE STEEL

Erik B. Van Perlstein, Beverwijk, and Hulbert W. den Hartog, Noordwijkerhout, both of Netherlands, assignors to Hoogovens Groep B.V., IJmuiden, Netherlands

Continuation-in-part of Ser. No. 307,477, Feb. 8, 1989, abandoned. This application Jun. 8, 1990, Ser. No. 535,310

Claims priority, application Netherlands, Feb. 17, 1988, 8800391

Int. Cl.[5] C22C *38/14*

U.S. Cl. 148—320 **3 Claims**

1. Non-ageing, low-alloy, hot-rolled, strip-formed formable steel having less than 0.1% Si, from 98.514–99.971 wt. % Fe and having a carbon content in the range 0.02 to 0.10 wt. % and a thickness in the range 0.5 to 5.0 mm, wherein the contents of non-oxide bound titanium, nitrogen and sulphur in wt. % satisfy the conditions:

$$Ti \geq 2.28N$$

$$Ti \leq 3.43N + 1.5S$$

and the steel is free from titanium carbide and niobium carbide.

4,985,091

CORROSION RESISTANT DUPLEX ALLOYS

John H. Culling, St. Louis, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed Jan. 12, 1990, Ser. No. 464,233

Int. Cl.[5] C22C *38/42*

U.S. Cl. 148—325 **16 Claims**

1. A low-nickel low-molybdenum content austenitic-ferritic stainless steel alloys having excellent resistance to pitting corrosion comprising:

Nickel	2–5% by weight
Chromium	23–28%
Molybdenum	0.50–1%
Copper	0.50–4%
Nitrogen	0.08–0.32%
Tungsten	0.10–0.60%
Carbon	0.08% maximum
Iron	essentially balance

wherein the ratio of austenite to ferrite is in the range of 60% to 40% and 40% to 60%, respectively.

4,985,092

STEEL HAVING GOOD WEAR RESISTANCE

Hiroshi Kaede, Nagoya; Tadahiro Koike, Tokai; Shinji Kato, Okazaki; Yorishige Maeda; Yoshio Fuwa, both of Toyota; Shigetoshi Sugimoto, Aichi; Hikaru Aoyagi, and Shinzi Shibata, both of Toyota, all of Japan, assignors to Aichi Steel Works, Limited, Tokai and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Continuation-in-part of Ser. No. 329,318, Mar. 27, 1989, abandoned, which is a division of Ser. No. 204,729, Jun. 10, 1988. This application Apr. 11, 1990, Ser. No. 508,537

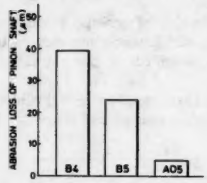
Claims priority, application Japan, Jun. 11, 1987, 62-146000; Sep. 11, 1987, 62-230446

Int. Cl.[5] C22C *38/18*

U.S. Cl. 148—326 **8 Claims**

1. A steel having good wear resistance consisting essentially

of, by weight, 0.55–1.10% of C, up to 2.0% of Si, up to 2.0% of Mn, 12.0–23.5% of Cr and 0.05–1.10% of Al, the remainder being Fe and inevitable impurities, said steel having fine chromium carbide particles of 0.2–8.0% by area ratio with a size of 2–12 μm in average particle size.



4,985,093

MELT CAST EXPLOSIVES

Charles R. McCulloch, Atlanta, Ga., assignor to Explosive Research and Development Corporation, Atlanta, Ga.

Filed Nov. 15, 1989, Ser. No. 436,575
Int. Cl.[5] C06B 45/10
U.S. Cl. 149—19.4 5 Claims

1. An explosive composition comprising in a mixture 15 to 90 percent by weight 2,4,6 trinitrotoluene 10 to 85 percent by weight of a polymer comprising an hydroxy telomerized polyol having a functionality of at least two cross-linked with a polyisocyanate having a functionality of at least two said polymer having a solubility parameter range of 10.5 to 13.5 $(cal./cc)^{\frac{1}{2}}$ and said polyol and polyisocyanate each having a molecular weight of no more than about 1000.

4,985,094

THERMOPLASTIC CASTABLE COMPOSITE ROCKET PROPELLANT

Boris D. Nahlovsky, and Gilbert A. Zimmerman, both of Sacramento, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 7, 1990, Ser. No. 489,562
Int. Cl.[5] C06B 45/10
U.S. Cl. 149—19.92 8 Claims

1. A process for producing a thermoplastic composite rocket propellant which comprises melt blending about 3 to 10 wt % of a styrene-diene block copolymer, about 3 to 20 wt % of a plasticizer, up to about 3 wt % of a resin modifier, up to about 1 wt % of a ballistic modifier and 0.3 to 0.5 wt % of a bonding agent, wherein the plasticizer:copolymer ratio is about 1:1 to 3:1, adding about 70 to 94 wt % energetic particulates to the melt, with mixing, and casting the mixture in a suitable mold.

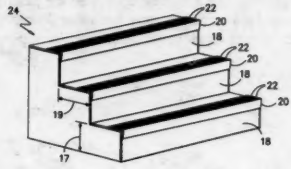
4,985,095

PREFORMED STAIR RISER TILE PRODUCT

Dennis L. Riddle, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 28, 1988, Ser. No. 263,808
Int. Cl.[5] B31F 1/00; E04F 11/00
U.S. Cl. 156—064 2 Claims

1. A method to form a stair riser carpet tile product comprising the steps of: selecting a carpet tile having a pile face and fairly stiff backing, measuring the height of a stair riser on the face of the carpet tile, scoring the face of the carpet tile across the width thereof along the measured dimension, bending the carpet tile at an angle of substantially 90° in a direction away from the face of the carpet pile and adhering a nose guard to the carpet tile along the whole length of the score line.

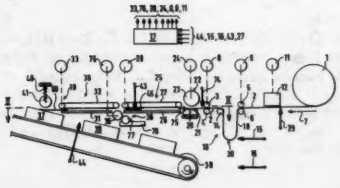


4,985,096

METHOD FOR DISPENSING OF LABELS

Per Bekker-Madsen, Vojens, Denmark, assignor to R. Ancker Jorgensen A/S, Birkerod, Denmark

Filed Sep. 22, 1989, Ser. No. 411,301
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1988, 3832239; Aug. 23, 1989, 3927821
Int. Cl.[5] B32B 31/00
U.S. Cl. 156—64 1 Claim



1. A method of dispensing labels to be glued onto a product, comprising the steps of

Conveying a strip of labels which consists only of consecutively arranged labels, without gaps, to a separation site;

separating individual labels from said strip of labels at said separation site, in response to a first signal;

transporting a single separated label from said separation site to a ready position at which the label is held stationary;

detecting the presence of a label at said ready position, and producing said first signal when detecting a change from "label present" to "label absent" state; and

in response to a second signal derived from detecting the product on its way to a labelling position, routing the single label from said ready position, past a device for coating the label with adhesive, to said labelling position to be adhered to the product.

4,985,097

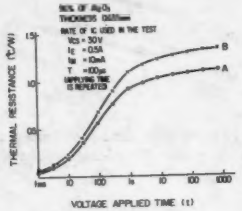
JOINED METAL COMPOSITE AND METHOD FOR PRODUCTION THEREOF

Kazuo Matsumura, Kawasaki; Mitsuhiro Nagata, Yokohama, and Tadashi Tanaka, Matsudo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Division of Ser. No. 171,451, Mar. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 910,970, Sep. 24, 1986. This application Jun. 16, 1989, Ser. No. 368,166
Claims priority, application Japan, Sep. 26, 1985, 60-211056
Int. Cl.[5] B32B 31/00
U.S. Cl. 156—87 4 Claims

1. A method for the production of a joined ceramic-copper composite substrate comprising a ceramic substrate and a copper sheet directly joined to one or each of opposite surfaces of said ceramic substrate and containing no gap in an interface

between said ceramic substrate and said copper sheet, which method comprises the steps of preparing said copper sheet by forming on the surface thereof for contact with said ceramic substrate a plurality of grooves produced by plastic deformation, whereby said grooves may be subsequently recovered and flattened out at an elevated temperature, superposing said



ceramic-copper composite substrate with the grooved surface of said copper sheet held contiguously to said ceramic substrate, heating the superposed layers at a temperature in the range of 1,065° to 1,083° C. thereby joining said ceramic substrate and said copper sheet by fusion and recovering and flattening out said grooves, and cooling the hot composite consequently formed.

4,985,098

METHOD OF MANUFACTURING CERAMIC LAMINATE

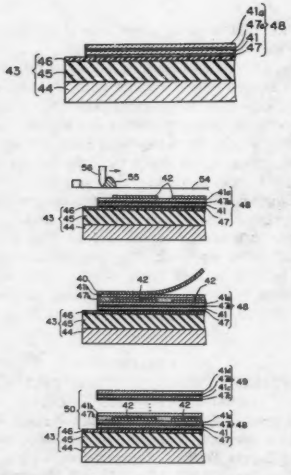
Yoshiaki Kohno, and Norio Sakai, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 16, 1989, Ser. No. 312,024

Claims priority, application Japan, Feb. 19, 1988, 63-37949

Int. Cl.[5] B32B *31/20;* **C04B** *41/88;* **H01G** *4/14*

U.S. Cl. 156—89 **35 Claims**



1. A method of manufacturing a ceramic laminate comprising the following steps:

preparing a plurality of ceramic green sheets containing a first ceramic powder and a first binder;

preparing a metal paste, containing a metal powder and a second binder;

preparing a junction member containing a solvent which can commonly dissolve said first binder and said second binder;

preparing a base for receiving said plurality of ceramic green sheets thereon;

stacking said plurality of ceramic green sheets on said base and applying said junction member to the interface between each adjacent pair of said plurality of ceramic green sheets; and

forming a film of said metal paste in the interface between at least one adjacent pair of said plurality of ceramic green sheets.

4,985,099

PROCESS FOR INCREASING RESISTANCE TO PENETRATION THROUGH A GLAZED OPENING

Guy Mertens, Namur; Jean-Jacques Reydams, Chaumont-Gistoux, and Michel Wasterlain, Courcelles, all of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Jun. 1, 1989, Ser. No. 359,567

Claims priority, application Luxembourg, Jun. 15, 1988, 87241

Int. Cl.[5] B32B *35/00*

U.S. Cl. 156—94 **8 Claims**

1. A process for increasing resistance to penetration of glass in a glazed opening, the process comprising:

removing the glass from the glazed opening; and

replacing the glass by laminated glazing consisting of the glass removed to which is fastened, by cementing with the aid of at least one intermediate layer of thermoplastic material, a sheet of thinner glass which has dimensions substantially equal to those of the glass removed except for having a thickness which is less than that of the glass removed, and which has been subjected to a chemical tempering treatment.

4,985,100

PROCESS FOR BUILDING PNEUMATIC RADIAL TIRES WHEREIN TWO BUILDING DRUMS ROTATE BETWEEN TWO BUILDING POSITIONS

Naoki Sasaki, Hiratsuka, and Katuhide Kawaguchi, Numazu, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1989, Ser. No. 360,700

Claims priority, application Japan, Nov. 29, 1988, 63-299572

Int. Cl.[5] B29C *35/00;* **B29D** *30/08;* **B60C** *9/02*

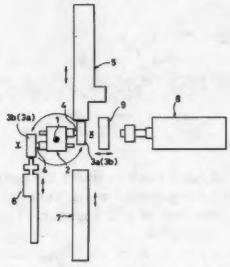
U.S. Cl. 156—110.1 **4 Claims**

1. In a tire building apparatus having a body of a building apparatus which is freely rotatable about a turning shaft, two building drums mounted on said body of the building apparatus and maintaining a symmetrical point with respect to said turning shaft so as to correspond to a first building position and a second building position, respectively, the positions of said two building drums being allowed to be alternately changed over between said first position and said second position by the turn of said body of the building apparatus, said tire building apparatus further having a reinforcing belt applying device, a cap tread applying device and a belt-tread assembly transfer device that are arranged at said first building position, and a fiber cord

winding device that is arranged at said second building position, a process for building radial tires comprising:

(a) a step for turning the body of the building apparatus to alternately change a position of one building drum to the first building position and of the other building drum to the second building position;

(b) a step for forming a belt cover layer by winding at least one fiber cord endlessly and spirally using the fiber cord winding device on a reinforcing belt that has been previously wound on the building drum switched to the second building position as a result of changing the positions of said two building drums;



(c) a step for completing the belt-tread assembly by winding a cap tread using said cap tread applying device on a reinforcing belt and on a belt cover layer thereon that have been previously wound on the building drum switched to the first building position concurrent with the operation for forming the belt cover layer carried out at the second building position, removing said belt-tread assembly from the building drum using said transfer device, and newly winding a reinforcing belt using said reinforcing belt applying device on the building drum from which the belt-tread assembly has been removed, all successively in the order mentioned; and

(d) repeating steps (a), (b) and (c).

4,985,101

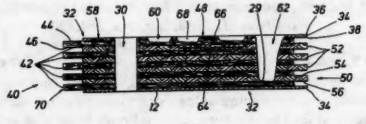
METHOD FOR THE FABRICATION OF SANDBLASTED COMPOSITE SIGNS

Gordon L. Brown, Jr., Bristol, Tenn., assignor to Morrison Molded Fiber Glass Company, Bristol, Va.

Filed Sep. 18, 1989, Ser. No. 408,342

Int. Cl.[5] B24C *1/04, 1/06;* B32B *31/16*

U.S. Cl. 156—154 **1 Claim**



1. A method of fabricating a sign apparatus comprising the steps of:

providing a sign body having;

at least one first laminate material means having a first outer surface and a second surface defined parallel to said first outer surface and having one predominant fiber pattern and interstitial cavities defined therethrough,

at least one second laminate material means having a first surface and a second surface defined parallel to said first surface, a portion of said first surface of said second laminate material means bound to a portion of said second surface of said first laminate material means, said second laminate material means having a second predominant fiber pattern dissimilar from said first predominant pattern and having interstitial cavities defined therethrough, and

hardened resin commonly interspersed throughout said first laminate material means and said second laminate material means interstitial cavities and commonly interspersed between said first laminate material means and said second laminate material means, to form a continuous mass throughout and between said material means, dimensionally stabilizing said fiber patterns and binding said material means together, said resin being homogeneously erodible,

providing a grit material having the capability of blasting through a portion of said erodible hardened resin, and

blasting said grit material against said homogeneously erodible hardened resin to erode said resin sufficiently to visually expose at least one of said predominate fiber patterns.

4,985,102

METHOD OF MAKING FIBER REINFORCED POLYAMIDE SHEETS

James J. Chatsick, Port Hope, and Peter A. Sipos, Kingston, both of Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Continuation of Ser. No. 73,476, Jul. 15, 1987, abandoned. This application Apr. 9, 1990, Ser. No. 506,148

Int. Cl.[5] B29D *9/00*

U.S. Cl. 156—163 **11 Claims**

1. A method for manufacturing fibrous reinforced resin sheet wherein either (a) the material for such sheet is fed onto a carrier web of an oriented film, or (b) the material for such sheet is fed onto a carrier web, a top web is fed onto the top of the material and the resulting sandwich of top web, material and carrier web is passed through constricting means for controlling the thickness and shape of the transverse section of the sandwich, and wherein at least one of the top web and carrier web is an oriented nylon film; the improvement wherein the nylon film contains an additive selected from at least one copper salt, at least one alkali metal salt, at least one alkaline earth metal salt and mixtures thereof.

4,985,103

METHOD OF FABRICATING CYLINDRICAL CERAMIC LAMINATED BODY

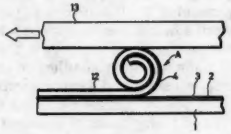
Yoshiaki Kouno, and Morio Sakai, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 13, 1989, Ser. No. 450,037

Claims priority, application Japan, Dec. 13, 1988, 63-315408

Int. Cl.[5] B32B *18/00*

U.S. Cl. 156—184 **8 Claims**



1. A method of fabricating a cylindrical ceramic laminated body, comprising the steps of:

forming a ceramic green sheet on one major surface of a carrier film;

laminating said ceramic green sheet on a base plate having a flat upper surface;

releasing said ceramic green sheet from said carrier film;

applying a joining agent containing a solvent capable of

dissolving a binder contained in the ceramic green sheet to the upper surface of the ceramic green sheet; and

cylindrically winding said ceramic green sheet while releasing the same from the base plate.

4,985,104

METHOD OF MANUFACTURING A VINYL CHLORIDE-COATED METAL SHEET

Shuichi Moriizumi, Ibaraki; Kenichi Masuhara, Chiba; Hidetoshi Yamabe, Chiba; Takao Tomosue, Chiba; Kouji Mori, Chiba, and Hisaharu Kaneko, Ibaraki, all of Japan, assignors to Lonseal Corporation and Nissin Steel Company Ltd., both of Tokyo, Japan

Continuation of Ser. No. 83,372, Aug. 10, 1987, abandoned. This application Sep. 18, 1989, Ser. No. 408,292

Int. Cl.[5] B32B *31/28*

U.S. Cl. 156—244.11 **24 Claims**

1. A method of manufacturing a vinyl chloride-coated metal sheet comprising:

(a) coating a surface of a metal sheet with an adhesive adapted to be cured by electron radiation without the need for heating;

(b) laminating a vinyl chloride film to said surface; and

(c) irradiating said surface with electron rays thereby bonding said film to said metal sheet, wherein said vinyl chloride film is a blend comprising a vinyl chloride resin, from about 20 to 40 parts by weight of a plasticizer comprising dioctyl sebacate, from about 1.0 to 6.0 parts by weight of a di-n-octyl tin mercaptide stabilizer, and a low molecular weight polyethylene lubricant.

4,985,105

TAPING APPARATUS FOR LEAD FRAME

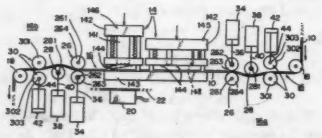
Norihiro Masuda, Nagano, Japan, assignor to Shinko Electric Industries Co., Ltd., Nagano, Japan

Filed Jan. 22, 1990, Ser. No. 468,078

Claims priority, application Japan, Jan. 21, 1989, 1-12277

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—261 **12 Claims**



1. A taping apparatus for making taping members used for lead frames, comprising:

a die having at least one punch for punching and cutting a heat-adherent flexible tape into individual taping members, said punch being provided with means for holding a cut taping member so that said cut taping member is moved toward a heat-adhesion surface while held by said punch;

a heater block defining said heat-adhesion surface on which a lead frame is rested and heated thereby, said taping member being pushed against said lead frame in such a manner that said taping member is heated and adhered to said lead frame;

means for defining a passage for feeding said tape in a longitudinal direction thereof, said passage extending either side of said die;

means for intermittently feeding said tape along said passage in synchronization with an operation of said die;

first and second releasable retaining means for retaining said tape at first and second positions of said feeding passage upstream and downstream of said die with respect to a feeding direction of the tape, respectively; and

at least one slack-providing means comprising a member located between said first and second positions in such a manner as to project across said feeding passage and be retracted therefrom to provide slack in said tape.

4,985,106

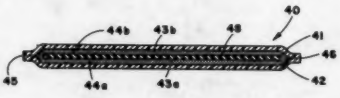
INSULATION STRUCTURE FOR APPLIANCES

Thomas E. Nelson, Anchorage, Ky., assignor to Soltech, Inc., Shelbyville, Ky.

Continuation-in-part of Ser. No. 931,150, Nov. 17, 1986, abandoned, and a continuation-in-part of Ser. No. 177,439, Apr. 4, 1988. This application Jul. 15, 1988, Ser. No. 220,027

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—276 **24 Claims**



1. A method of fabricating an insulation panel for use on an appliance for reducing one or more undesirable side effects caused by the operation of said appliance, said method comprising the following steps:

(a) preparing a first layer of enclosing material that corresponds to the size and shape of the appliance area to be covered;

(b) applying a first layer of loose, discrete insulation material onto said first layer of enclosing material in a blanket of substantially uniform thickness;

(c) applying an intermediate insulation pad onto said blanket of substantially uniform thickness of said discrete insulation material;

(d) applying a second layer of loose, discrete insulation material over said intermediate insulation pad in a blanket of substantially uniform thickness;

(e) introducing a binder into said insulation material;

(f) preparing a second layer of enclosing material which has a size and shape which is substantially the same as said first layer;

(g) laminating said second layer onto said blanket of insulation material; and

(h) joining the edge peripheries of said first and second layers of enclosing material so as to define an enclosed cavity.

4,985,107

COMPONENT LOCATION DEVICE AND METHOD FOR SURFACE-MOUNT PRINTED CIRCUIT BOARDS

Walter J. Conroy, Saratoga, and William Katona, Santa Clara, both of Calif., assignors to SCI Systems, Inc., Huntsville, Ala.

Filed Mar. 1, 1988, Ser. No. 162,427

Int. Cl.[5] B32B *1/00*

U.S. Cl. 156—299 **27 Claims**

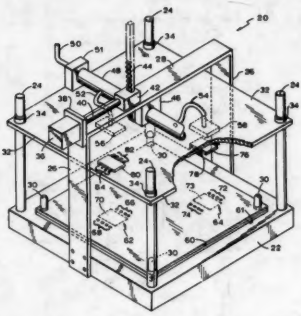
1. A device for accurately placing at least one electrical circuit component having at least one mounting foot serving as an electrical lead on a printed circuit board having at least one conductive pad thereon, said pad having an outer peripheral outline with said foot accurately aligned with and contacting said pad with the foot within the outer peripheral outline of the pad,

said device comprising, in combination,

a printed circuit board support member for accurately locating and supporting a printed circuit board in a pre-determined location, said printed circuit board having conductive mounting pads thereon in a pre-determined array matching that of mounting feet on an electrical circuit component to be mounted on said pads, each pad having an outer peripheral outline,

a solder stencil having holes therethrough in a pre-deter-

mined array matching that of said mounting pads with each hold also defining the position of said foot, each said hole in said pattern member being dimensioned with an inner peripheral outline which corresponds to the outer peripheral outline of said pad to receive said foot therein with relatively close tolerances and thereby position said electrical circuit component in a pre-determined location relative to said pad with each foot in attaching contact within the outer peripheral outline of said pad,



placement means for separating said electrical circuit component and said stencil from one another while maintaining a pre-determined relationship between the locations of said component and said pad, and for bringing said component foot and said pad together in contact with one another with said foot in attaching contact within the outer peripheral outline of said pad.

4,985,108

METHOD OF MOUNTING A MECHANICAL QUANTITY SENSOR ELEMENT

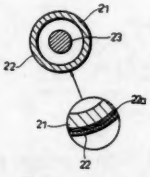
Naomasa Kimura; Masayuki Nishiguchi, and Minoru Noguchi, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 1,406, Jan. 8, 1987, Pat. No. 4,784,003. This application Sep. 30, 1988, Ser. No. 251,802

Claims priority, application Japan, Jan. 10, 1986, 61-2130; Sep. 10, 1986, 61-211778; Sep. 10, 1986, 61-211779; Sep. 10, 1986, 61-211780

Int. Cl.[5] B32B *31/24*

U.S. Cl. 156—272.4 **9 Claims**



1. A method for fixing a mechanical quantity sensor element formed of a ribbon made of noncrystalline magnetic alloy on a surface of an object for mechanical quantity measurement for the purpose of detecting a mechanical quantity by making use of a stress-magneto effect of noncrystalline magnetic alloy having positive magnetostriction, characterized in that said mechanical quantity sensor element is mounted to the surface of the object for mechanical quantity measurement with a tacky material, said mechanical quantity sensor element is magnetically attracted onto said surface by subjecting said sensor element to an external magnetic field, and the layer thickness of said tacky material is made uniform by magnetic attractive forces which act uniformly over the entire surface of said mechanical quantity sensor element.

4,985,109

APPARATUS FOR PLASMA PROCESSING

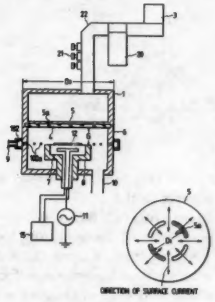
Toru Otsubo, Fujisawa; Mitsuo Tokuda, Tachikawa; Yasuhiro Yamaguchi, Chigasaki; Ichirou Sasaki; Kazuhiro Ohara, both of Yokohama; Hirohisa Usuami, Fuchu, and Junzou Azuma, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1990, Ser. No. 475,889

Claims priority, application Japan, Feb. 8, 1989, 1-27406

Int. Cl.[5] B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—345 **49 Claims**



1. A plasma processing apparatus comprising:

microwave generator means for generating microwaves;

waveguide means for supplying microwaves generated by the microwave generator means;

cavity resonator means for resonating the microwaves supplied by the waveguide means;

plasma processing chamber means, the plasma processing chamber means being coupled to the cavity resonator means for receiving resonated microwaves therefrom and for generating a plasma therein, the plasma processing chamber means having means for holding a substrate for plasma processing, means for introducing a plasma processing gas to the plasma processing chamber means, and means for exhausting gas therefrom;

separation plate means for separating the cavity resonator means and the plasma processing chamber means and for enabling resonated microwaves to be transmitted therethrough from the cavity resonator means to the plasma processing chamber means; and

slot plate means disposed in the cavity resonator means in opposition to a surface of the substrate for enabling radiation of the resonated microwaves to the plasma processing chamber means through the separation plate means, the slot plate means including at least one set of circumferentially extending slots for enabling radiation of resonated microwaves having a power density of at least 1 W/cm^2.

4,985,110

LABELLING APPARATUS

Werner Becker, Hirschhorn, Fed. Rep. of Germany, assignor to Esselte Meto International Produktions GmbH, Hirschhorn, Fed. Rep. of Germany

Filed Dec. 19, 1989, Ser. No. 453,926

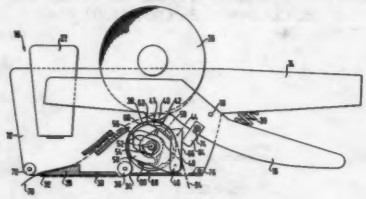
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3843113

Int. Cl.[5] B65C *11/00*

U.S. Cl. 156—540 **3 Claims**

1. In a labelling apparatus comprising a housing, a transport

means for a label strip which runs in the apparatus from a supply roll over a deflection edge, then along a housing bottom which is adapted to be pivoted out of the housing, through an introduction slot in the housing bottom to a transport roll carried by the housing bottom and rotatable about an axis and finally to an exit slot, a drive connection existing between the transport roll and an operating lever pivotal between a rest position and a pulled position, the improvement comprising a drive connection including a rack (50) which is in engagement with a pinion (54) mounted on the shaft (52) of the transport roll (38) and is articulately connected to one arm (48) of a



two-armed pivot lever (46) which is pivotal about an axis (44) stationary with respect to the axis (52) of the transport wheel (38) and that the two arms (42, 48) of the pivot lever (46) are arranged in the pivot path of the operating lever (16) in such a manner that on pivoting thereof from the rest position to the pulled position a movement transmission from the operating lever (16) to the one arm (42) of the two-armed pivot lever takes place whilst on the return of the operating lever (16) from the pulled position into the rest position a movement transmission from the operating lever (16) to the other arm (48) of the two-armed pivot lever (46) takes place.

4,985,111

PROCESS AND APPARATUS FOR INTERMITTENT FLUID APPLICATION

Karl F. G. Ketelhohn, State College, Pa., assignor to Chemcut Corporation, State College, Pa.

Filed Mar. 2, 1990, Ser. No. 487,593

Int. Cl.[5] B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—640 **20 Claims**

1. A process for chemically treating articles in a chamber with a liquid treatment fluid, wherein the fluid is applied to articles being treated along a path of travel for the articles, the process including the steps of:

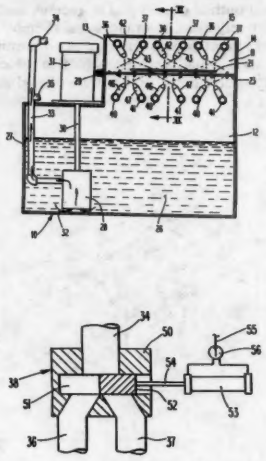
(a) providing a substantially closed chamber for treating articles therein;

(b) delivering articles along a path of travel through the chamber;

(c) applying a liquid treatment fluid to articles being delivered along their path of travel through the chamber by:

(i) providing a plurality of discharge orifices for treatment fluid at at least some different angular orientations relative to the path of travel of articles, and

(ii) sequentially discharging and interrupting the discharge of, treatment fluid, through orifices of different angular orientations relative to the path of travel of articles,



whereby treatment fluid, in an interrupted manner, impinges on articles at different angles of impingement.

4,985,112

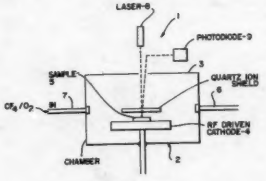
ENHANCED PLASMA ETCHING

Frank D. Egitto, Binghamton, and Walter E. Mlynko, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 9, 1987, Ser. No. 12,696

Int. Cl.[5] H01L *21/00*

U.S. Cl. 156—643 **9 Claims**



1. A method for etching an article by plasma etching wherein said article includes a substrate and a surface of organic material selected from the group of polyimides, polyamides, epoxy resins, phenolic-aldehyde polymers, and polyolefins thereon which comprises:

positioning the article to be etched on a cathode;

enclosing in a container the cathode and the article to be etched;

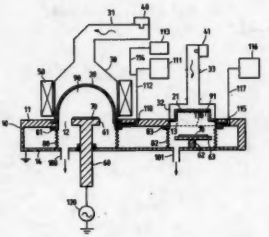
introducing an etchant gas into said container wherein said etchant gas is a mixture of a fluorocarbon and oxygen; and

applying power to the cathode in an oscillating mode to thereby enhance the etching rate, wherein the power is cycled between about 500 watts and about 50 watts.

4,985,113
SAMPLE TREATING METHOD AND APPARATUS

Kotaro Fujimoto; Yoshie Tanaka; Hironobu Kawahara, and Yoshiaki Sato, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 7, 1990, Ser. No. 489,550
Claims priority, application Japan, Mar. 10, 1989, 1-56473
Int. Cl.[5] C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 20 Claims

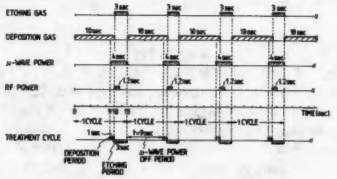


1. A sample treating method comprising:
a step for generating a plasma of an etching said step for etching a sample by utilizing said plasma of said etching gas;
a step for generating a plasma of an anticorrosion gas that is capable of removing from said sample adhered matters formed by said step for etching of said sample; and
a step for anticorrosion-treating said etched sample by utilizing said plasma of said anticorrosion gas.

4,985,114
DRY ETCHING BY ALTERNATELY ETCHING AND DEPOSITING

Sadayuki Okudaira, Ome; Hiroshi Kawakami, Hachioji; Tokuo Kure, Tokyo; Kazunori Tsujimoto, Higashiyamato, and Shinichi Tachi, Sayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 6, 1989, Ser. No. 418,223
Claims priority, application Japan, Oct. 14, 1988, 63-256953
Int. Cl.[5] H01L 21/306, 21/321, 21/311
U.S. Cl. 156—643 8 Claims



8. A dry etching method comprising the steps of:
alternately introducing an etching gas and a deposition gas into a reaction chamber at predetermined time intervals; and
alternately etching an exposed surface of an article to be etched and causing a film to be deposited on said surface of said article by applying power to said introduced etching and deposition gases to alternately generate an etching plasma and deposition plasma said etching and deposition plasma alternately coming into contact with said article in said reaction chamber in order to alternately etch and cause a film to be deposited on said surface of said article so as to etch said surface, and said power being applied after passage of a predetermined amount of time from the start of the introduction of said deposition gas and before the introduction of said etching gas and cut off when the introduction of said etching gas is suspended.

4,985,115
METHOD FOR ETCHING GLASS

Thomas De Rossett, Jr., 10551 Morada Dr., Orange, Calif. 92669

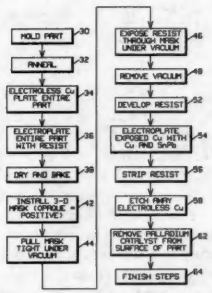
Filed Aug. 16, 1989, Ser. No. 395,013
Int. Cl.[5] B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—654 17 Claims

1. An improved method for storing coded information onto a glass surface for subsequent retrieval by etching said information in coded format into said glass surface and subsequently reading said image to retreive and decode said information, said method comprising the steps of:
a. generating a graphic image including a bar code to be etched into said glass surface, said bar code representing said information to be stored;
b. transferring said image to a tissue stencil including an etch resistant barrier by selectively perforating said etch resistant barrier by means of a plurality of cylindrical rods;
c. applying said stencil including said image over said glass surface to be etched;
d. applying an etchant in a defined pattern across the rear surface of said stencil;
e. applying a nearly uniform pressure to the etchant to distribute the etchant over the rear surface of said stencil to force said etchant through the perforations in said etch resistant barrier of said stencil into contact with said glass surface thereby to etch said glass surface; and
f. removing said stencil and residue left on the surface being etched leaving said image etched in the surface of the glass.

4,985,116
THREE DIMENSIONAL PLATING OR ETCHING PROCESS AND MASKS THEREFOR

John H. Mettler, North Haven; William L. Johnson, New Haven; William C. Strickland, and Victor V. Zaderej, both of North Haven, all of Conn., assignors to Mint-Pac Technologies, Inc., North Haven, Conn.

Filed Feb. 23, 1990, Ser. No. 484,387
Int. Cl.[5] B44C 1/22; C03C 15/00, 25/06; C23F 1/02
U.S. Cl. 156—656 38 Claims



34. A method for printing and plating a substrate, comprising the ordered steps of:
molding an insulative substrate to a predetermined shape;
annealing said insulative substrate;
electroless plating said substrate with copper;
electroplating said substrate with a photoresist material;
drying and baking said photoresist material;
installing a flexible mask over said substrate;

pulling said flexible mask into close registration with said substrate by applying a vacuum between said mask and said substrate;

exposing said substrate to non-collimated light through said mask;

removing said mask from said substrate;

developing said photoresist material to expose areas of plated substrate while covering other areas of plated substrate;

electroplating said exposed areas of plated substrate with a conductive material;

etching said other areas of plated substrate to remove said plating on said other areas; and

stripping said photoresist to expose said other areas of plated substrate.

4,985,117

METHOD OF MANUFACTURING JOSEPHSON JUNCTIONS

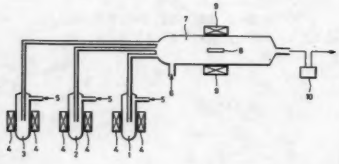
Hideyuki Kurosawa, Kumagaya; Toshio Hirai; Hisanori Yamane, both of Sendai, and Tsutomu Yamashita, Nagaoka, Japan, assignors to Kabushiki Kaisha Riken and Research Development Corporation of Japan, both of Tokyo, Japan

Filed Jan. 1, 1990, Ser. No. 473,406

Claims priority, application Japan, Feb. 4, 1989, 1-24773; Aug. 31, 1989, 1-225322

Int. Cl.[5] B44C *1/22*; B05D *5/12*; C23C *14/00*; C23F *1/02*

U.S. Cl. 156—659.1 **13 Claims**



1. A method of manufacturing a thin film Josephson junction, comprising the steps of:

heating β-diketonate complexes of yttrium, borium, and copper elements each in a separate raw material vessel to a temperature corresponding to the vapor phase temperature of the respective elements;

heating a substrate in a reaction vessel to a temperature corresponding to a temperature suitable for decomposing and polymerizing said vapors;

supplying an inert carrier gas to each raw material vessel at a predetermined flow rate;

mixing in the reaction vessel the inert carrier gas and vapors from each of the raw material vessels with oxygen;

subjecting the heating substrate to the mixture of the vapors and inert gas and oxygen for a time period in accordance with the desired thickness of the thin film;

cooling the substrate at a predetermined rate; and

forming a micro bridge pattern in said thin film to provide the Josephson junction.

4,985,118

METHOD FOR TREATING PHOTOGRAPHIC PROCESS WASTE LIQUOR THROUGH CONCENTRATION BY EVAPORATION

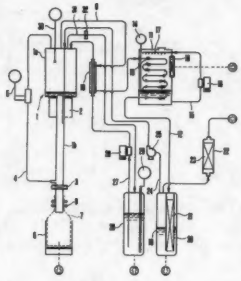
Masayuki Kurematsu; Shigeharu Koboshi; Kazuhiro Kobayashi, and Naoki Takabayashi, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 169,324, Mar. 17, 1988, abandoned. This application Apr. 23, 1990, Ser. No. 513,442

Claims priority, application Japan, Mar. 24, 1987, 62-69435; Mar. 24, 1987, 62-69437

Int. Cl.[5] B01D *1/00, 3/42*

U.S. Cl. 159—47.3 **5 Claims**



1. A method of treating photographic process waste liquor to concentrate the waste liquor in an evaporation vessel by evaporation, comprising the steps:

(a) feeding the waste liquor into the evaporation vessel;

(b) controlling the surface tension of the waste liquor to about 20 to 65 dyne/cm;

(c) heating the liquor at a heat density of up to 17.2 kcals/cm^2 to evaporate the waste liquor;

(d) detecting the quantity of waste liquor in the evaporation vessel and, stopping the feeding of the waste liquor when the liquor is at a predetermined level for a predetermined time; and starting the feeding of the waste liquor when the liquor is below a predetermined level for a predetermined time; and

(e) feeding a gas into the waste liquor in the evaporation vessel;

whereby good thermal efficiency is promoted and the generation of noxious gases is restrained.

4,985,119

CELLULOSE FIBER-REINFORCED STRUCTURE

Kenneth D. Vinson, Germantown, and Byron J. L. Huff, Memphis, both of Tenn., assignors to The Procter & Gamble Cellulose Company, Memphis, Tenn.

Continuation of Ser. No. 69,462, Jul. 1, 1987, abandoned. This application May 8, 1989, Ser. No. 348,744

Int. Cl.[5] D21F *11/00*; D21H *17/00*

U.S. Cl. 162—149 **18 Claims**

1. A process for making a cellulose-fiber-reinforced structure, said process comprising the steps of:

a. mixing a water-curable inorganic binder with water and between about 4% and 15% pulped softwood fibrous material, based upon the total solids of said structure, wherein said fibrous material has a summerwood fiber number percentage at least the minimum summerwood fiber number percentage provided by the equations:

SuW (minimum)=for C less than or equal to 30; and

SuW (minimum=65, for C greater than 30;

wherein SuW (minimum is minimum number percentage of summerwood fibers based upon the total number of fibers, and C is fibrous material coarseness index; and

b. curing said mixture.

4,985,120

METHOD FOR CONTROLLING PITCH DEPOSITS IN PULP AND PAPERMAKING PROCESSES WITH ORGANOTITANIUM (IV) COMPOUND

John H. Buzby, Willow Grove, and Robert D. Evans, Warminster, both of Pa., assignors to Quaker Chemical Corporation, Conshohocken, Pa.

Filed Aug. 17, 1990, Ser. No. 568,918
Int. Cl.[5] D21H *21/02;* D21C *9/08*
U.S. Cl. 162—199 19 Claims

1. A method for controlling pitch present in pulping and papermaking processes comprising:

(a) formulating a pitch control agent consisting essentially of a water-soluble organotitanium(IV) compound; and

(b) adding the pitch control agent to a water stream that comes into contact with cellulose pulp fibers in the pulping and papermaking processes in an amount sufficient to reduce or remove the deposition of the pitch on machinery used in the pulping and papermaking processes and to reduce the deposition of the pitch in paper produced in the papermaking processes,

wherein the pitch is a naturally occurring resin-based deposit originating in an extractive fraction of wood used in the pulping and papermaking processes.

4,985,121

CERAMIC FOAM MEMBER FOR EXTRACTING WATER FROM A PAPER WEB IN A PAPERMAKING MACHINE

Thomas G. Gulya, Appleton; Gary V. Schultz, Kimberley, and Ronald A. Arnold, Marinette, all of Wis., assignors to Appleton Mills, Appleton, Wis.

Division of Ser. No. 356,942, May 25, 1989, Pat. No. 4,888,095.
This application Aug. 21, 1989, Ser. No. 396,131
Int. Cl.[5] D21F *1/54*
U.S. Cl. 162—352 11 Claims

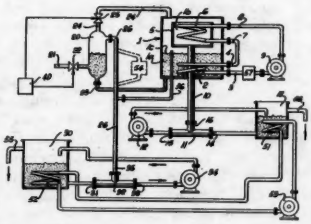
1. In a papermaking machine, a liquid permeable member having a surface disposed to support a moving fibrous web containing liquid, said member being composed of a rigid mass of ceramic foam material having a plurality of interconnected cells, said material having an air permeability in the range of 10 to 1,000 cubic feet per square foot of surface area per minute, and a compressive strength greater than 100 psi.

4,985,122

VACUUM DISTILLATION APPARATUS AND METHOD WITH PRETREATMENT

Colin W. Spencer, Bilgola, Australia, assignor to Vaqua Limited, Frenchs Forest, Australia

Filed Dec. 16, 1988, Ser. No. 294,486
Claims priority, application Australia, Jun. 18, 1986, PH6512
Int. Cl.[5] B01D *3/10;* C02F *1/04, 1/20*
U.S. Cl. 203—11 18 Claims



1. A method for pretreating a liquid to be supplied to an evaporator of a continuous vacuum still which vaporizes liquid to produce a vapor and condenses said vapor to produce a distillate, said method comprising the steps of:

(1) admitting a quantity of liquid to a pre-chamber from a supply;

(2) sealing the pre-chamber from the supply;

(3) controlling the temperature and/or pressure in the pre-chamber to remove volatile components from a residual liquid;

(4) transferring at lest some of the residual liquid to said evaporator, and

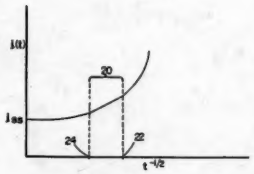
(5) repeating the steps 1 to 4 while maintaining the evaporator and said distillate in isolation from said removed volatile components.

4,985,123

IN SITU POLAROGRAPHIC SENSOR CALIBRATION

Michael G. Curley, Wellesley, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 24, 1989, Ser. No. 328,444
Int. Cl.[5] G01N *27/46*
U.S. Cl. 204—153.1 8 Claims



1. Method for calibrating a coated polarographic sensor for the determination of species chemical potential comprising:

(a) exposing the sensor to a calibration medium having known temperature and species chemical potential and allowing the sensor to equilibrate with respect to the calibration medium;

(b) polarizing the sensor with respect to a reference electrode and monitoring the resulting transient and steady state electrochemical currents;

(c) deriving a transient calibration constant characterizing transient sensor performance from the transient electrochemical current;

(d) deriving a quasi-steady state calibration constant characterizing steady state sensor performance from the steady state electrochemical current;

(e) placing the sensor in a medium of known temperature whose species chemical potential is to be determined and allowing the sensor to equilibrate with respect to the medium;

(f) polarizing the sensor with respect to a reference electrode and monitoring the resulting transient and steady state electrochemical currents;

(g) using the transient electrochemical current and the transient calibration constant to accurately derive the chemical potential of the species; and

(h) using the chemical potential of the species derived in (g) and the steady state electrochemical current to adjust the quasi-steady state calibration constant for subsequent determination of species chemical potential.

7. A method of determining the chemical potential of a species using a coated polarographic sensor comprising:

calibrating the sensor using the method of claim 1,

operating the sensor in a continuously polarized state, and

using the adjusted quasi-steady state calibration constant and the steady state electrochemical current to determine the chemical potential of the species.

4,985,124

ELECTRICALLY CONDUCTING POLYHETEROAROMATICS AND A PROCESS FOR THEIR PREPARATION

Uwe Claussen, Leverkusen, and Udo Herrmann, Dormagen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 31, 1989, Ser. No. 331,472

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1988, 3813362

Int. Cl.[5] C25B *3/00*

U.S. Cl. 204—72 5 Claims

1. In a process for the preparation of an electrically conducting polyheteroaromatic by electrochemically oxidizing the monomeric heteroaromatic compound in an electrolyte cell comprising an anode, a cathode and a liquid electrolyte system which electrolyte system contains the monomeric heteroaromatic compound, water, a surfactant, a co-surfactant or a mixture of a surfactant and a co-surfactant with depositing of the polyheteroaromatic on the surface of the anode, the improvement which comprises using as the electrolyte system a microemulsion which is formed by the monomeric compound, the water, the surfactant and the co-surfactant.

4,985,125

METHOD FOR DETECTING MEAT FRESHNESS USING A BIOSENSOR

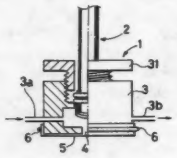
Etsuo Watanabe, Kanagawa, and Masakazu Hoshi, Tokyo, both of Japan, assignors to Taiyo Fishery Co., Ltd., Tokyo, Japan

Division of Ser. No. 289,552, Dec. 22, 1988, abandoned. This application Dec. 7, 1989, Ser. No. 449,245

Claims priority, application Japan, Jan. 8, 1988, 63-2021

Int. Cl.[5] G01N *27/40, 27/327*

U.S. Cl. 204—153.12 4 Claims



1. A method for detecting freshness of meat comprising

providing a biosensor comprising a main body and a built-in sensing electrode provided therein, said sensing electrode being provided with a sensing part, operable to generate a signal in response to a molecule to be assayed and to which a buffer solution can be constantly fed, and said main body being provided with an inlet which is brought into direct contact with a specimen to thereby incorporate the molecule to be assayed from said specimen therethrough, said inlet being covered with a membrane through which the molecule to be assayed can permeate,

contacting the meat with the inlet of the biosensor,

feeding the buffer solution to the sensor part, and measuring the signal generated by the sensing electrode; and

correlating the signal with the degree of freshness of the meat.

4,985,126

APPARATUS AND PROCESS FOR CONTINUOUSLY MONITORING CONCENTRATIONS OF GASEOUS COMPONENTS IN GAS MIXTURES, WITH EXCEPTION OF O_2

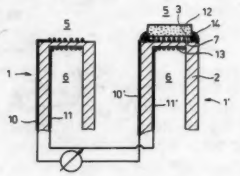
Edelbert Haefele, Karlsruhe, and Michael Kotter, Bruchsal-Untergrombach, both of Fed. Rep. of Germany, assignors to Kernforschungszenthrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 30,527, Mar. 27, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 299,108

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1986, 3610363

Int. Cl.[5] G01N *27/407*

U.S. Cl. 204—153.14 18 Claims



1. Process for continuously monitoring the concentration of a gaseous component in a gas mixture, the mixture containing at least one of the gases CO, NH_3, SO_2, NO, O_3 and hydrocarbons and additionally containing oxygen in a known concentration, in which the gaseous component being monitored is not O_2, comprising:

(a) continuously generating and measuring electrical signals which are a function of the concentration of the gaseous component being monitored by bringing the gas mixture into contact with at least one electrochemical cell having at least one solid body which contains an oxygen-ion-conducting solid electrolyte material having a metal-oxide-containing electrode and generates electrical signals which are a function of the concentration of the component being monitored and

(b) automatically and electronically evaluating the measured signals in a computer which converts the measured signals into concentration values and compares the converted values with reference values of a program which was earlier programmed into the computer.

9. Apparatus for continuously monitoring the concentration of a gaseous component in a gas mixture, the mixture containing at least one of the gases CO, NH_3, SO_2, NO, O_3 and hydrocarbons and additionally containing oxygen in a known concentration, in which the gaseous compound being monitored is not O_2, comprising (1) a computer for automatically and electronically evaluating measure signals from a measurement unit, for converting the measured signals into concentration values, and for comparing the converted values with reference values of a program which was earlier programmed into the computer, and (2) a measurement unit which is comprised of a first gas sampling probe and a second gas sampling probe which is electrically connected to the first gas sampling probe, with each gas sampling probe having (i) a material that conducts oxygen ions and stays in contact with the measurement gas, with the material that conducts oxygen ions having a measurement gas side which has a surface that faces away from the measurement gas, (ii) an electrode mounted on the surface facing the measurement gas, (iii) an electrode mounted on the surface facing away from the measurement gas, (iv) and an electrical off-lead for transmitting measured signals that are generated in the measurement unit, wherein

(a) each electrode on the surface which faces the measurement gas is a solid body structure,

(b) each solid body is made of metallic components and oxidic components or of oxidic components, and

(c) wherein a first set of electrical leads is mounted on the oxygen-ion-conducting material on the surface of each probe which faces the measurement gas, and a second set of electrical leads is mounted on the oxygen-ion-conducting material on the surface which is turned away from the measurement gas, and wherein the first set of electrical leads is connected to the computer to supply the computer with the measured signals, and the second set of electrical leads is joined together,

and one of the probes has a gas-permeable catalyst layer which accelerates the chemical conversion of the gas component, the catalyst layer being on the side which faces the measurement gas and positioned above the solid electrode structure, and wherein the catalyst layer seals off the interstitial space to the oxygen-ion-conducting material and to the solid electrode body structure.

4,985,127

ELECTRODIALYTIC CONVERSION OF MULTIVALENT METAL SALTS USING SULFONATE IONS

Daniel J. Vaughan, 36 Paxon Dr., Wilmington, Del. 19803

Filed Dec. 29, 1989, Ser. No. 459,131

Int. Cl.[5] B01D *61/44*

U.S. Cl. 204—182.4 **11 Claims**

1. A process for the electrodialytic conversion of salts of multivalent metal cations in an aqueous solution into the acid of the salt anion or a halogen if the salt anion is halide, said aqueous solutions being selected from solutions comprising cations of barium, strontium, calcium, lead and other cations that form substantially water insoluble salts with sulfate anions and said salts and salts of other multivalent and monovalent cations, which comprises electrotransporting at least multivalent metal cations from said aqueous solution through a cation permeable membrane into a second aqueous solution containing a sulfonate anion that forms a water soluble salt with barium, strontium, calcium, lead and other cations that form substantially water insoluble salts with sulfate anions.

4,985,128

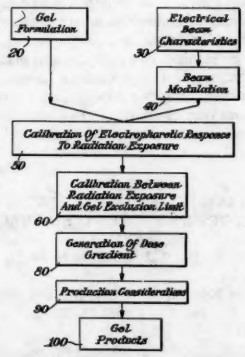
PROCESS FOR PREPARATION OF ELECTROPHORESIS

Richard C. Ebersole, Wilmington, and Robert P. Foss, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 235,399, Aug. 24, 1988, abandoned, which is a division of Ser. No. 928,154, Nov. 7, 1986, Pat. No. 4,840,756, which is a division of Ser. No. 604,586, Apr. 27, 1984, Pat. No. 4,704,198. This application Jan. 9, 1990, Ser. No. 463,899

Int. Cl.[5] C08F *2/46*

U.S. Cl. 204—182.8 **5 Claims**



1. A method of electrophoretically separating bioorganic molecules using a porous electrophoretic gel product comprising an aqueous-swelled porous polymer matrix formed of homo- or co-polymers which defines a volume, the polymer matrix being formed from water soluble, ethylenically unsaturated monomers which can undergo ionizing radiation initiated polymerization, the product characterized by having a constant atomic composition over its volume, an absence of a polymerization catalyst, being stable, having a controlled electrophoretic resolving capacity that is responsible from gel to gel for the electrophoretic separation of charged macromolecular substances, having length, width and thickness dimensions, and having a porosity gradient along one of the length and width dimensions and uniform porosity along the thickness dimension which dimension is relatively thin, by the steps of placing a sample of bioorganic molecules on the gel product, and applying a voltage across a dimension other than the thickness dimension.

4,985,129

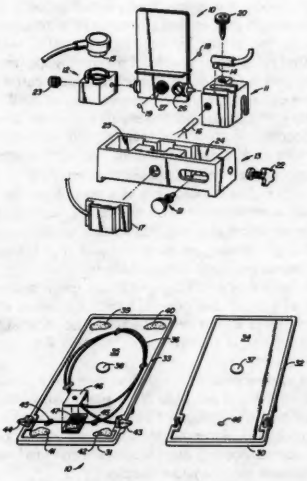
APPARATUS FOR CAPILLARY ELECTROPHORESIS

Samuel Burd, Oakland, Calif., assignor to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed Dec. 2, 1988, Ser. No. 279,382

Int. Cl.[5] G01N *27/28, 27/26;* B01D *57/02*

U.S. Cl. 204—299 R **9 Claims**



8. A combination buffer reservoir and sample injection block for high performance capillary electrophoresis, comprising (a) a single block shaped to define therein:

(i) a reservoir for buffer solution, adapted to receive an electrode;

(ii) an injection port adapted for fluid-tight insertion therein of a syringe;

(iii) an outlet port adapted for fluid-tight communication with a capillary column; and

(iv) first, second and third ducts communicating said reservoir, injection port and outlet port, respectively, to a common junction inside said block;

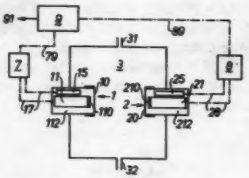
(b) valve means adapted to close said first duct to seal said reservoir off from said common junction, and (c) overflow means for permitting the escape of excess liquid flowing into said reservoir.

4,985,130

AMPEROMETRIC METHOD AND APPARATUS

John M. Hale, Meinier, Switzerland, assignor to Orbisphere Laboratories, Inc., Switzerland

Division of Ser. No. 201,202, Jun. 1, 1988, Pat. No. 4,906,339.
This application Dec. 7, 1989, Ser. No. 447,522
Claims priority, application European Pat. Off., Jun. 5, 1987, 87810325.8
Int. Cl.[5] G01N 27/40
U.S. Cl. 204—415 9 Claims



1. An apparatus for quantitative determination of a first and normally gaseous electroactive species and of a second electroactive and normally gaseous species in a fluid medium containing said first species in a first concentration and said second species in a second concentration, said apparatus comprising:

a first membrane-enclosed amperometric cell having a working electrode that is selectively sensitive only to said first electroactive species and a sensing face arranged within a containment means for holding or passing said medium; said first cell being capable of producing an amperometric signal that is indicative of said first concentration; a second membrane-enclosed amperometric cell having a working electrode that is sensitive to both said first and said second electroactive species; said second cell having a sensing face arranged within said containment means; said second cell being capable of producing an amperometric signal that is indicative of a sum of said first and said second concentration; and means for receiving said first amperometric signal and said second amperometric signal, and for generating an output signal that is indicative, at least, of said second concentration;

wherein said first working electrode has a sensing surface made of gold and is operated with a counter electrode at a potential at which said sensing surface of said first working electrode is sensitive only to said first electroactive species; and

wherein said second working electrode has a sensing surface made of a metal selected from platinum, platinum-group metals and alloys thereof and is operated with a counter electrode at a potential at which said sensing surface of said second working electrode is sensitive to both said first and second electroactive species.

4,985,131

PROCESS FOR TREATING OIL SLUDGE

George M. Lane, New Orleans, La., assignor to Thermal Waste Management, New Orleans, La.

Continuation of Ser. No. 213,721, Jun. 30, 1988, abandoned.
This application Nov. 21, 1989, Ser. No. 440,471
Int. Cl.[5] C10G 17/00
U.S. Cl. 208—13 9 Claims

1. A process for treating petroleum refinery sludge to produce a solid residue product which process comprises:

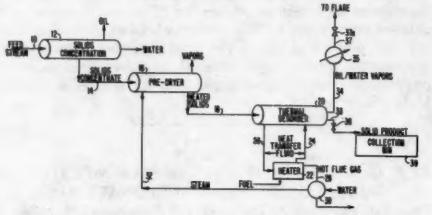
(a) forming a feed-stream of an oily petroleum refinery sludge containing organic solid material boiling about 1000° F. and water;

(b) pretreating said feed-stream to adjust the water content thereof to between about 5% and about 25%, based upon the total weight of the resulting pre-treated feed-stream;

(c) introducing the resulting pre-treated feed-stream into a thermal sludge drier wherein said pre-treated feed-stream is indirectly heated by a heat transfer medium;

(d) heating said pretreated feed-stream in said drier to a temperature above the boiling point of water and below the temperature at which thermal cracking of said feed-stream occurs;

(e) maintaining the heated feed-stream in a nonoxidative atmosphere in said sludge drier for a time sufficient for



said water in said feed-stream to form steam and for said steam to strip any light hydrocarbons from the solid material in said feed-stream to form a solid residue;

(f) separating a hydrocarbon-water vapor stream from said solid material; and

(g) recovering said solid material as a solid residue product having a BTU content between about 3000 and 10,000 BTU/lb.

4,985,132

MULTIZONE CATALYTIC REFORMING PROCESS

Mark D. Moser, Elk Grove Village; R. J. Lawson, Palatine; Li Wang, Mt. Prospect, all of Ill.; Vivekanand Parulekar, Wichita, Kans.; Roger L. Peer, LaGrange, Ill., and Charles R. Hamlin, Girimsby, England, assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 306,732, Feb. 6, 1989, Pat. No. 4,929,333. This application Jul. 13, 1989, Ser. No. 379,397
The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.
Int. Cl.[5] C10G 35/085
U.S. Cl. 208—65 16 Claims

1. A process for the catalytic reforming of hydrocarbons comprising contacting the hydrocarbon feed in two sequential catalyst zones, wherein:

(a) an initial catalyst zone which is a fixed-bed system and contains an initial catalytic composite comprising a platinum component, a germanium component, a refractory inorganic oxide, and a halogen component; and

(b) a terminal catalyst zone which is a moving-bed system with associated continuous catalyst regeneration and contains a terminal catalytic composite having the essential absence of germanium and comprising a platinum component, a refractory inorganic oxide, a halogen component, and catalytically effective amounts of a metal promoter selected from one or more of the rhenium, tin, indium, rhodium, ruthenium, cobalt, nickel, and iridium.

4,985,133

REDUCING NO_x EMISSIONS FROM FCC REGENERATORS BY SEGREGATED CRACKING OF FEED

Ajit V. Sapre, W. Berlin, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Feb. 12, 1990, Ser. No. 479,308
Int. Cl.[5] C10G 71/00
U.S. Cl. 208—78 15 Claims

1. In a fluidized catalytic cracking process wherein a fresh feed mixture of high and low nitrogen containing hydrocarbon feeds contact a source of hot regenerated catalyst in the base of

a riser cracking reactor means to produce catalytically cracked products and spent catalyst containing coke contaminated with nitrogen compounds, wherein the spent catalyst is stripped in a catalyst stripping means to produce stripped catalyst which is regenerated in a catalyst regeneration means to produce a regenerated catalyst which is recycled to the cracking reactor means, and wherein a flue gas comprising nitrogen oxides (NO_x) is withdrawn from the regenerator, the improvement comprising segregating the fresh feed mixture into at least two different fresh feed fractions having different nitrogen contents, said segregated feed fractions comprising a low nitrogen content fresh feed and a high nitrogen content fresh feed having at least a 50% greater concentration of nitrogen than the low nitrogen content fresh feed, adding said high nitrogen content fresh feed via a feed addition means at an elevation in the base of the riser reactor, and separately adding said low nitrogen content fresh feed to the riser reactor at a higher elevation in said riser reactor and downstream of the point of addition of said high nitrogen content fresh feed, whereby the NO_x content of the flue gas is reduced relative to operation with a feed comprising a mixture of said high and said low nitrogen containing feedstocks.

4,985,134

PRODUCTION OF GASOLINE AND DISTILLATE FUELS FROM LIGHT CYCLE OIL

W. Rodman Derr, Jr., Vincentown; Peter J. Owens, Mantua, and Michael S. Sarli, Haddonfield, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 8, 1989, Ser. No. 433,251
Int. Cl.[5] C10G *47/02, 65/12*
U.S. Cl. 208—89 **23 Claims**

1. A process for the co-production of high quality gasoline and distillate products from catalytically cracked feedstocks which comprises:

(i) hydrocracking a substantially dealkylated feedstock with a hydrocracking catalyst at a hydrogen partial pressure not greater than 1200 psig and a conversion to gasoline boiling range products not more than 75 wt. percent;

(ii) separating the products of hydrocracking into a gasoline boiling range fraction, a first distillate range fraction boiling immediately above the gasoline fraction with an end point int he range of 450° to 500° F. and a second distillate fraction boiling above the first distillate fraction;

(iii) recycling at least a portion of the first distillate fraction to the hydrocracking step to effect saturation and partial cracking of aromatics int he recycled fraction to increase the paraffin content of the second distillate fraction;

(iv) recovering the second distillate fraction.

4,985,135

SURFACE SILYLATED ZEOLITE CATAYSTS, AND PROCESSES FOR THE PREPARATION, AND USE OF SAID CATALYSTS IN THE PRODUCTION OF HIGH OCTANE GASOLINE

Ian A. Cody, Clearwater, Canada, and Glen P. Hamner, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 292,670, Dec. 30, 1988, Pat. No. 4,906,599. This application Jan. 10, 1990, Ser. No. 463,191
Int. Cl.[5] C10G *47/16*
U.S. Cl. 208—114 **8 Claims**

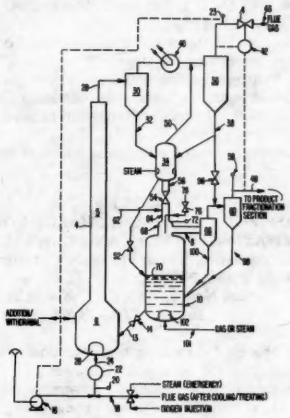
1. A process for selectively hydrocracking an aromatic hydrocarbon feed which comprises hydrocracking said feed at hydrocracking conditions with a hydrocracking catalyst constituted of a metal hydrogenation component composited with a zeolite which contains, at ambient temperatures, greater than 50 percent NH_4^+ sites, and on its surface a chemisorbed silica-containing species, such that at hydrocracking temperatures ammonia is evolved to convert the zeolite to a surface silylated acid zeolite.

4,985,136

ULTRA-SHORT CONTACT TIME FLUIDIZED CATALYTIC CRACKING PROCESS

David B. Bartholic, 75 Wetumpka La., Watchung, N.J. 07060

Filed Nov. 5, 1987, Ser. No. 116,910
Int. Cl.[5] C10G *11/18*
U.S. Cl. 208—153 **18 Claims**



1. A fluidized process for the conversion of a hydrocarbon oil charge stock to lower molecular weight liquid product comprising:

(a) atomizing a primary charge-stock to provide a stream of liquid particles of a preselected size;

(b) introducing said atomized primary charge-stock substantially horizontally into a primary reaction zone;

(c) introducing a stream of hot fluidized cracking catalyst particles mixed with gaseous dispersion media downwardly into said reaction zone at a velocity greater than 10 feet per second to intimately contact said atomized primary charge-stock therein, the temperature, pressure and contact time with said atomized primary charge-stock being sufficient to vaporize hydrocarbons in said charge-stock and to crack the hydrocarbons to lower molecular weight product;

(d) vaporizing a substantial portion of said hydrocarbons to form a mixture of said catalyst particles in the resulting vaporized hydrocarbons and cracking said vaporized hydrocarbons in said reaction zone to form cracked product vapors and spent catalyst;

(e) rapidly passing a mixture of the resulting cracked product vapors, said media and a majority of said spent catalyst particles substantially horizontally through said reaction zone and into a reactor separation zone to provided a hydrocarbon/catalyst contact time prior to passage into said separation zone of not greater than 0.5 second and separating spent catalyst particles from said cracked product, said spent catalyst particles containing deposit of carbonaceous material thereon which reduce the cracking activity of said catalyst;

(f) passing said spent catalyst particles to a combustion zone;

(g) contacting said spent catalyst with an oxygen-containing gas in said combustion zone to burn said carbonaceous deposits and to provide a regenerated catalyst and a flue gas;

(h) recycling the resulting hot, regenerated catalyst to said reaction zone to contact fresh atomized charge-stock; and

(i) recovering a hydrocarbon product having a molecular weight lower than said charge stock.

4,985,137

PROCESS FOR THE REMOVAL OF MERCURY FROM NATURAL GAS CONDENSATE

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 27, 1989, Ser. No. 343,701
The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.
Int. Cl.[5] C01G 13/00; C07C 7/148; C10G 29/02
U.S. Cl. 208—251 H 20 Claims

1. A process for the removal of mercury from natural gas condensate comprising the steps of:

mixing hydrogen sulfide with said natural gas condensate,

passing said mixture of natural gas condensate and hydrogen sulfide over a hydrodesulfurization catalyst in a reactor, and

simultaneously passing a stripping gas over said catalyst.

4,985,138

PROCESS FOR TREATING A CHARGE CONTAINING DEWAXING SOLVENT AND DEWAXED OIL

Mordechai Pasternak, Spring Valley, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 8, 1989, Ser. No. 433,237
Int. Cl.[5] C10G 73/04
U.S. Cl. 208—308 16 Claims

1. The process for treating a charge containing dewaxing solvent and dewaxed oil which comprises

passing said charge containing dewaxing solvent and dewaxed oil into contact with, as separating membrane, a non-porous separating polyimine layer which has been cross-linked with a polyisocyanate or with a poly(carbonyl chloride) cross-linking agent;

maintaining a pressure drop across said membrane thereby forming a high pressure retentate containing increased content of dewaxed oil and decreased content of dewaxing solvent and a low pressure permeate containing increased content of dewaxing solvent and decreased content of dewaxed oil;

maintaining the pressure on the low pressure discharge side of said membrane above the vapor pressure of said permeate thereby maintaining said permeate in liquid phase;

maintaining the pressure on the high pressure retentate side of said membrane above the vapor pressure of said charge containing dewaxing solvent and dewaxed oil and sufficient to drive permeate across said membrane by thereby maintaining said charge dewaxing solvent and dewaxed oil and said retentate in liquid phase;

recovering said permeate containing increased content of dewaxing solvent and decreased content of dewaxed oil; and

recovering said retentate containing increased content of dewaxed oil and decreased content of dewaxing solvent.

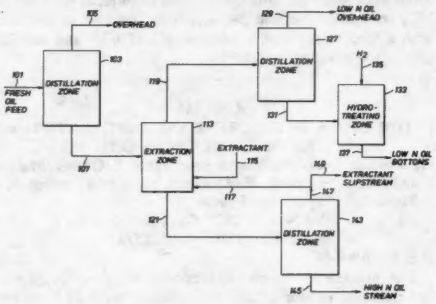
4,985,139

TWO-STEP HETEROCYCLIC NITROGEN EXTRACTION FROM PETROLEUM OILS WITH REDUCED REFINERY EQUIPMENT

Ajay M. Madgavkar, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 14, 1988, Ser. No. 219,509
Int. Cl.[5] C10G 17/04, 21/06
U.S. Cl. 208—321 12 Claims

1. A process for the removal of heterocyclic nitrogen compounds from a petroleum crude oil or fraction thereof, without heat removal of said crude oil or fraction thereof, wherein said petroleum crude oil or fraction thereof is at a temperature of from about 400° F. to about 800° F. at a pressure of from 1 atmosphere to 100 atmospheres, which process comprises treating said petroleum crude oil or fraction thereof, which is rich in basic heterocyclic nitrogen compounds, without cooling of said stream in a two-phase extraction zone comprising an extraction consisting essentially of an aqueous solution of a lower carboxylic acid in a concentration of from about 20 up to 95 weight percent in aqueous phase, at separation conditions, to extract, at a temperature of from about 300 to 500° F. and a pressure of from about 2 atmospheres to about 100 atmospheres wherein said pressure is maintained within said extraction zone to prohibit solvent flashing during said extraction at the temperature at which said petroleum crude oil or fraction is received in said two-phase extraction zone without cooling, said basic heterocyclic nitrogen compounds with said lower carboxylic acid and thereby remove at least a portion of said basic heterocyclic nitrogen compounds from said petroleum crude oil or fraction thereof and to form a raffinate stream comprising a petroleum oil with a lean content of basic heterocyclic nitrogen compounds and an extract stream comprising an aqueous phase containing said lower carboxylic acid and having an increased content of basic heterocyclic nitrogen compounds, passing said raffinate stream to a distillation step, without heating, to distill said raffinate stream at a temperature



of 300° F. to about 700° F. and a pressure of 1 atmosphere to 10 atmospheres to produce a first distillation overhead stream and a first distillation bottoms stream and passing said bottoms stream to a catalytic hydrotreatment zone to hydrotreat said bottoms stream in the presence of hydrogen and a catalytic composition of matter, at hydrotreatment conditions, to remove basic heterocyclic nitrogen compounds and recovering a hydrotreated petroleum crude oil stream having a lower content of basic heterocyclic nitrogen compounds than present in said raffinate stream and passing said extract stream to a distillation step, without heating, to distill said extract stream, at a temperature of from about 200° F. to about 700° F. and a pressure of 0.05 atmosphere to 2 atmospheres to produce a second distillation overhead stream and a second distillation bottoms stream having a high content of nitrogen-containing compounds and recycling at least a portion of said second distillation overhead stream to said extraction zone and recovering said second distillation bottom stream.

4,985,140

APPARATUS FOR MEASURING FLASH POINT OF PETROLEUM INTERMEDIATE FRACTION AND METHOD FOR CONTROLLING FLASH POINT

Naohide Saito; Shohei Shibuya, and Kentaro Inomata, all of Niigata, Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Aug. 24, 1988, Ser. No. 235,524
Claims priority, application Japan, Aug. 27, 1987, 62-211247
Int. Cl.[5] B01D 3/42
U.S. Cl. 208—347 2 Claims

1. An apparatus for measuring a flash point of a petroleum intermediate fraction which comprises:

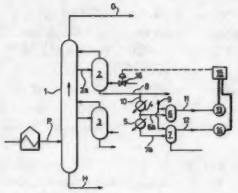
a first device for measuring a first gas concentration at a first predetermined temperature of the intermediate fraction so as to provide a first signal indicating the first gas concentration;

a second device for measuring a second gas concentration at

a second predetermined temperature, having a certain deviation from the first predetermined temperature, of the intermediate fraction so as to provide a second signal indicating the second gas concentration;

a third device for generating a third signal representative of the difference between the first and second gas concentration divided by a difference between the first and second predetermined temperatures; and

a fourth device for obtaining a fourth signal determined by an arithmetical calculation based on the third signal from the third device wherein said fourth signal corresponds to the flash point of the intermediate fraction.



4,985,141

LIQUID-LIQUID CONTACTOR COLUMNS

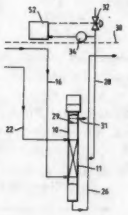
Douglas E. Parker, Caterall, and Dennis H. Logsdail, Icknield, both of United Kingdom, assignors to The Secretary of State for the United Kingdom Atomic Energy Authority in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, United Kingdom

Filed Mar. 15, 1989, Ser. No. 323,858

Claims priority, application United Kingdom, Mar. 21, 1988, 8806698; Jan. 26, 1989, 8901739

Int. Cl.[5] B01D *11/04*

U.S. Cl. 210—90 **9 Claims**



4. A liquid-liquid contactor column including air-lift means for lifting liquid from a lower part of the column to a liquid outlet, means for sensing air pressure supplied to the air-lift means and for providing electrical signals responsive to the sensed pressure, including means for pulsing the column, and electrical means for processing the signals, wherein the electrical means for processing the signals discriminates between first signal components attributable to pulsing of the column and second signal components attributable to pulsing of the air-lift means.

4,985,142

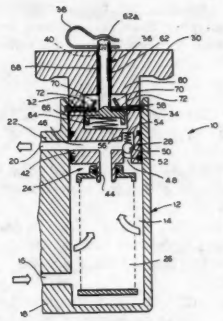
QUICK RELEASE FILTER BY-PASS VALVE

John E. Laycock, and Ray C. Ramirez, both of San Diego, Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 15, 1989, Ser. No. 451,144

Int. Cl.[5] B01D *35/147*

U.S. Cl. 210—130 **20 Claims**



1. A quick release filter by-pass valve, comprising:

a housing defining a filter chamber having an inlet communicating with said filter chamber at one end of said housing and an outlet communicating with said filter chamber at the other end of said housing;

an integral filter-valve assembly removably positionable within said housing between said inlet and outlet, said filter-valve assembly including means for supporting a filter element within said filter chamber in a manner defining a primary flow path from said inlet, through said filter element, and to said outlet, said filter-valve assembly also including by-pass valve means defining a secondary flow path from said inlet to said outlet;

a handle integral with said filter-valve assembly and extending to a point externally of said housing for removing said filter-valve assembly from said filter chamber to replace said filter element;

means for retaining said filter-valve assembly within said housing, said retaining means including a retention blade retractably extendable into a groove in said housing and push button means operably associated with said retention blade for retraction thereof upon depression of said push button means and extension thereof upon release of said push button means, said push button means being accessible at a point externally of said housing; and

means for mechanically ensuring retention blade extension into said groove in said housing, said mechanical means being externally accessible, said mechanical means rendering said push button means selectively inoperable.

4,985,143

METHOD FOR PACKING CHROMATOGRAPHIC BEDS

David H. Freeman, Potomac; Rosalie M. Angeles, Germantown, and Suzanne Keller, Rockville, all of Md., assignors to The University of Maryland, College Park, Md.

Continuation of Ser. No. 202,405, Jun. 6, 1988, abandoned. This application Jan. 31, 1990, Ser. No. 472,436

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **6 Claims**

1. A process for packing column chromatography beds, consisting essentially of:

preparing a slurry of chromatographic bed material and a liquid comprising at least one of water, methanol, chloroform and hexane, the bed material being denser than the liquid,

introducing said slurry into a column provided with a re-

movable plug at one end and allowing said slurry to settle in said column such that said bed material falls to said plugged end,

thereafter centrifuging said column under the condition that the surface of the liquid is at all points and times above the surface of the bed material, with respect to said plugged end, and continuing said centrifuging for a period of time to obtain a predetermined packing level in said bed material in the substantial absence of channeling,

removing said plug from said column and allowing said liquid to drain through the bed and out of the column.

4,985,144

AFFINITY CHROMATOGRAPHY MATERIAL FOR ANTIGENS OF THE BACTERIA OF THE BORDETELLA GENUS

Marie-José B. Quentin-Millet, Villeurbanne, and Francois Arminjon, Lyon, both of France, assignors to Institut Merieux, Paris, France

Filed Apr. 15, 1987, Ser. No. 38,748

Claims priority, application France, Apr. 16, 1986, 86 05457

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **3 Claims**

1. A chromatography material comprising a solid support on which is fixed a ligand having an affinity for pertussis toxin, said ligand being a desialyled protein selected from the group consisting of desialyled fetuin and desialyled haptoglobin.

4,985,145

SEMIPERMEABLE MEMBRANES

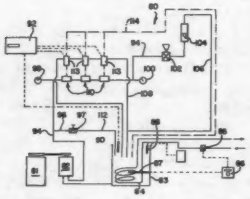
Ronald D. Sanderson, Stellenbosch; Norman A. Dowler, Belville, and Albert J. Van Reenen, Stellenbosch, all of South Africa, assignors to Water Research Commission, Transvaal Province, South Africa

Division of Ser. No. 53,333, May 22, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 304,910

Claims priority, application South Africa, May 30, 1986, 86/4070

Int. Cl.[5] B01D *13/00, 13/04*

U.S. Cl. 210—321.75 **4 Claims**



1. A semi-permeable membrane, which comprises a porous artifact; and a polyelectrolyte layer on the artifact, the polyelectrolyte layer comprising a polymer which has carboxylic acid functional groups as well as functional groups other than carboxylic acid groups, and which is selected from the group consisting of

(i) poly $(CH_2{=}C(Y_2)(COOH)—co—CH_2{=}C(Y_3)(Y_4))$ wherein

(a) when Y_2 is —H and $Y_3$is —H, Y_4 is $—OCH_3$, $—OC(O)CH_3$ or —OH;

(b) when Y_2 is -halogen and Y_3 is —H, Y_4 is $—OCH_3$, $—OC(O)CH_3$ or —OH;

(c) when Y_2 is $—OCH_3$ and Y_3 is —H, Y_4 is $—OC(O)CH_3$, —OH or $—OCH_3$;

(d) when Y_2 is —OH and Y_3 is —H, Y_4 is $—OCH_3$, $—OC(O)CH_3$ or —OH;

(ii) poly $(CH_2{=}CH\ COOH)—co—(CH_2{=}CH—OH)—co—(CH_2{=}CH—(Y_8))$ where

Y_8 is $—O—C(O)—(Y_9)$, Y_9 is $—CH_3$ or $—CH_2—_n\,CH_3$, n =1 to 3 or

Y_8 is $—C(O)—O—(Y_{10})$, Y_{10} is $—CH_3$ or $—CH_2—_n\,CH_3$, n=1 to 3 or

Y_8 is $—C(O)—CH_3$ or

Y_8 is $—O—CH_3$;

(iii) poly-$CH(COOX_2)—C(X_1)(COOX_3—)$-alt-$CH_2—CH(X_4)$— wherein X_1 is H, $—OCH_3$ or —OH, X_2 and X_3 are each —H, an alkyl group, a cycloaliphatic group, a phenyl, a substituted phenyl group, a polyether or a polyglycol chain of molecular mass 200 to 5000, and X_4 is $CH_3\,C(O))—$, —OH, or $—C(O)NH_2$;

(iv) poly $—CH(COOX_2)—C(X_1COOX_3)—co—CH_2—C(X_5)(X_6)$— wherein X_1, X_2, and X_3 are as defined above, and X_6 is $—OCH_3$ when X_5 is —H;

(v) the alkali metal salts or partial salts of the above polyacids,

said membrane having properties for providing salt rejection through both an electrokinetic mechanism provided by charged functional groups and a non-coulombic mechanism provided by non-charged functional groups.

3. A method of forming a semi-permeable membrane, which includes depositing a polymer which has carboxylic acid functional groups as well as functional groups other than carboxylic acid groups, and which is selected from the group consisting of:

(i) poly $(CH_2{=}C(Y_2)(COOH))—co—CH_2{=}C(Y_3)(Y_4))$ wherein

(a) when $Y_2$is —H and $Y_3$is —H, Y_4 is $—OCH_3$, $—OC(O)CH_3$ or —OH;

(b) when Y_2 is -halogen and Y_3 s —H, $Y_4$is $—OCH_3$, $—OC(O)CH_3$ or —OH;

(c) when Y_2 is $—OCH_3$ and Y_3 is —H, $Y_4$is $—OC(O)CH_3$, —OH or $—OCH_3$;

(d) when Y_2 is —OH and Y_3 is —H, Y_4 is $—OCH_3$, $—OC(O)CH_3$ or —OH;

(ii) poly $(CH_2{=}CH\ COOH)—co—(CH_2{=}CH—OH)—co—(CH_2{=}CH—(Y_8))$ where

Y_8 is $—O—C(O)—(Y_9)$, Y_9 is $—CH_3$ or $—CH_2—_n\,CH_3$, n=1 to 3 or

Y_8 is $—C(O)—O—(Y_{10})$, Y_{10} is $—CH_3$ or $—CH_2—_n\,CH_3$, n=1 to 3 or

Y_8 is $—C(O)—CH_3$ or

Y_8 is $—O—CH_3$;

(iii) poly-$CH(COOX_2)—C(X_1)(COOX_3—)$-alt-$CH_2—CH(X_4)$— wherein X_1 is H, $—OCH_3$ or —OH, X_2 and X_3 are each —H, an alkyl group, a cycloaliphatic group, a phenyl, a substituted phenyl group, a polyether or a polyglycol chain of molecular mass 200 to 5000, and X_4 is $CH_3\,C(O)O—$, —OH, or $—C(O)NH_2$;

(iv) poly $—CH(COOX_2)—C(X_1COOX_3)$-co-$CH_2—C(X_5)(X_6)$— wherein X_1, X_2 and X_3 are as defined above, and X_6 is $—OCH_3$ when X_5 is —H;

(v) the alkali metal salts or partial salts of the above polyacids

on a porous artifact, thereby to form a polyelectrolyte layer on the artifact, said membrane having properties for providing salt rejection through both an electrokinetic mechanism provided by charged functional groups and a non-coulombic mechanism provided by non-charged functional groups.

4,985,146

FILTERING SYSTEM

Robert J. Fox, Bowling Green, and Merlin P. Hoodlebrink, Bradner, both of Ohio, assignors to Clarmatic Industries, Inc., Pemberville, Ohio

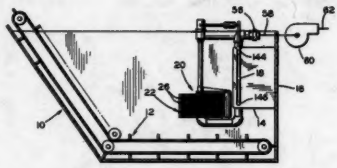
Filed Jan. 8, 1990, Ser. No. 461,731

Int. Cl.[5] B01D *21/02*

U.S. Cl. 210—413 **18 Claims**

7. A filtering system for filtering contaminants from a liquid, said system comprising a tank, means in said tank for receiving contaminants and for removing the contaminants from said tank, mounting means in said tank, and a filter drum assembly

comprising a filtering drum in said tank, a suction pipe supporting said drum and communicating with the interior of said drum, said suction pipe having means cooperating with said mounting means for supporting said pipe and said drum by said mounting means, a drive shaft, a wiper arm affixed to said shaft, a wiper affixed to said wiper arm and extending into



contact with an outer surface of said filtering drum, bearing means rotatably engaging a portion of said drive shaft, a supporting arm affixed to said bearing means and supported by said suction pipe, drive means for rotating said drive shaft and said wiper arm and supported by said suction pipe, and means for removably connecting said suction pipe to a suction pump.

4,985,147

LIQUID SEPARATION MEMBRANE FOR PERVAPORATION

Akira Mochizuki; Yoshio Sato; Hisashi Ogawara, all of Kurashiki, and Syuzo Yamashita, Kiyoneson, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Continuation of Ser. No. 815,453, Dec. 31, 1985, abandoned. This application Dec. 14, 1988, Ser. No. 284,828

Claims priority, application Japan, Jan. 8, 1985, 60-443; Jan. 30, 1985, 60-14503; Mar. 29, 1985, 60-63429

Int. Cl.[5] B01D *71/08*

U.S. Cl. 210—500.27 **6 Claims**

1. A membrane for pervaporation composed of a salt of chitosan containing at least 2 mole % of nonpolymeric polybasic acid ion based on the amino groups of the chitosan.

4,985,148

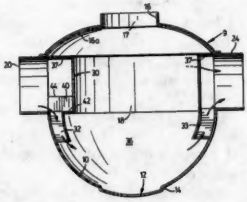
IMPROVED SEPARATOR TANK CONSTRUCTION

Joseph G. Monteith, Mississauga, Canada, assignor to Fibresep Ltd., Ontario, Canada

Filed Feb. 8, 1990, Ser. No. 476,872

Int. Cl.[5] B01D *17/025*

U.S. Cl. 210—519 **10 Claims**



1. A separator tank for rainwater and waste-water, comprising:

a container having a bottom and sidewall means defining an upwardly open chamber, and a lid closing said chamber,

inlet means at a first location on said sidewall means,

outlet means at a second location on said sidewall means,

passageway means forming part of the container and communicating said inlet means with said outlet means,

a first opening adjacent the inlet means, the first opening communicating the passageway means with said chamber,

a second opening adjacent the outlet means, the second opening also communicating the passageway means with said chamber,

the passageway means being sealed from communication with the chamber except for the said openings,

and weir means within the passageway means, the weir means being disposed with respect to said first opening such that, under relatively low entry flow rates, all entering materials are contained by the weir and flow through the first opening and into the chamber, whereas under relatively high entry flow rates, a portion of the entering materials overflow the weir and are delivered by the passageway means to said outlet means.

4,985,149

ANAEROBIC DIGESTION METHOD

Yoshio Ohshima, Tsukuba; Tsunekazu Watanabe, Tokyo; Keizaburo Watanabe, Tokyo; Noboru Nonoyama, Tokyo; Masayoshi Kitazume, Tokyo, and Yukihiro Tomita, Toride, all of Japan, assignors to Public Works Research Institute, Ministry of Construction, Tsukuba; Kabushiki Kaisha Yakult Honsha and Fujita Corporation, both of Tokyo, all of, Japan

Filed Mar. 20, 1989, Ser. No. 325,925

Int. Cl.[5] C02F *3/28*

U.S. Cl. 210—603 **1 Claim**

1. An anaerobic digestion method for excess sludge from a sewage treatment process, comprising:

subjecting the excess sludge to be digested to a medium stirring mill treatment with a medium stirring mill equipped with glass beads having a diameter of 0.05 to 1 mm and said mill treatment is carried out at 1,000 to 3,000 rpm for 5 to 60 min; and

performing anaerobic digestion on the treated material.

4,985,150

WATER TREATMENT USING OXIDIZED COAL

Izak J. Cronje, Verwoerdburg; Johannes Dekker, Pretoria, and Thomas E. Cloete, Pretoria, all of South Africa, assignors to National Energy Council, Pretoria, South Africa

Filed Apr. 18, 1989, Ser. No. 339,985

Claims priority, application South Africa, Apr. 19, 1988, 88/2727

Int. Cl.[5] C02F *1/42*

U.S. Cl. 210—661 **12 Claims**

1. A method of removing matter suspended or dissolved in an aqueous medium including the steps of:

loading the matter onto oxidized coal in particulate form by contacting the medium with the coal and separating the loaded coal from the medium;

wherein the oxidized coal (expressed on a dry ash-free basis) has an elemental analysis such that the coal includes carbon in a range from 59% to 78%, hydrogen in a range of from 2.4% to 5%, nitrogen in a range of from 1.0% to 3.8%, oxygen in a range of from 14.4% to 33.6% and sulphur in a range of from 0.2% to 8.0%; and

wherein the oxidized coal has a functional analysis such that total acidity is in a range of from 2.00 meq/g to 9.00 meq/g, carboxylic groups are in a range from 0.02 meq/g-5.00 meq/g and phenolic groups are in a range of from 2.00 meq/g to 5.00 meq/g.

4,985,151

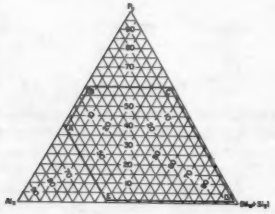
PROCESS FOR SEPARATING MOLECULAR SPECIES

Brent M. T. Lok, New City; Bonita K. Marcus, Rye; Lawrence D. Vail, New Rochelle; Edith M. Flanigen, White Plains; Robert L. Patton, Katonah, and Stephen T. Wilson, Shrub Oak, all of N.Y., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 182,738, Apr. 18, 1988, which is a division of Ser. No. 600,312, Apr. 13, 1984, Pat. No. 4,793,984. This application Sep. 19, 1989, Ser. No. 409,531

Int. Cl.[5] B01D *53/04*

U.S. Cl. 210—689 3 Claims



1. A process for separating molecular species from admixture with molecular species having a lesser degree of polarity which comprises contacting said mixture of molecular species with a molecular sieve having pore diameters large enough to adsorb at least one of the more polar molecular species, said molecular sieve being at least partially activated whereby molecules of the more polar molecular species are selectively adsorbed into the intracrystalline pore system thereof, said molecular sieve being a crystalline molecular sieve having a three-dimensional microporous framework structure of ELO_2, AlO_2, PO_2, SiO_2 oxide units and having an empirical chemical composition on an anhydrous basis expressed by the formula:

$$mR:(EL_wAl_xP_ySi_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the molar amount of "R" present per mole of $(EL_wAl_xP_ySi_z)O_2$ and has a value of zero to about 0.3; "EL" represents at least one element capable of forming a three dimensional oxide framework, "EL" is characterized as an element having a mean "T-O" distance in tetrahedral oxide structures between about 1.51 Angstroms and about 2.06 Angstroms, "EL" has a cation electronegativity between about 125 kcal/g-atom to about 310 kcal/g-atom and "EL" is capable of forming stable M-O-P, M-O-Al or M-O-M bonds in crystalline three dimensional oxide structures having an "M-O" bond dissociation energy greater than about 59 kcal/mole at 298° C.; and "w", "x", "y" and "z" represent the mole fractions of "EL", aluminum, phosphorus, and silicon, respectively, present as framework oxides, said mole fractions being within the pentagonal compositional area defined by points A, B, C, D and E of FIG. 1, wherein element "EL" and each of aluminum, phosphorus and silicon are present such that "w", "x", "y" and "z" are at least 0.01 and each element "EL" is present as a tetrahedral oxide unit ELO_2 in an amount of at least 0.01.

4,985,152

PROCESS FOR SEPARATING SOLVENTS USED IN THE PURIFICATION OF PRODUCTS

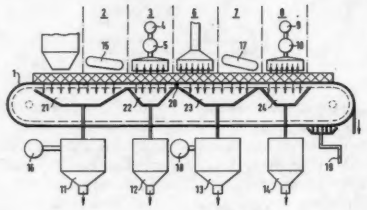
Josef Hilbig, Taunusstein; Guenther Welt, Frankfurt am Main, and Manfred Ziegelmayer, Bischofsheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 380,086

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1988, 3824147

Int. Cl.[5] B01D *11/02*

U.S. Cl. 210—771 6 Claims



1. A process for selectively separating solvents differing chemically or in physical composition, obtained in the preparation and purification of products, comprising the steps of:

(a) mechanically filtering a major portion of a moistening or suspending agent from a solventmoist reaction mass on a filter;

(b) applying on the same filter an amount of steam sufficient to remove the moistening or suspending agent substantially quantitatively from the reaction mass, and separately collecting the moistening or suspending agent;

(c) extracting byproducts of the reaction or impurities on the same filter with a suitable solvent or solvent mixture, in at least one stage, to produce an extract, and separately collecting the extract;

(d) mechanically separating a major portion of the extraction agent;

(e) applying an amount of steam sufficient to remove the extraction agent substantially quantitatively from the product, and separately collecting the extraction agent; and

(f) removing purified product from the filter.

4,985,153

METHOD FOR SEPARATING BLOOD INTO BLOOD COMPONENTS, AND BLOOD COMPONENTS SEPARATOR UNIT

Toru Kuroda, and Takao Nishimura, both of Oita, Japan, assignors to Asahi Medical Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1989, Ser. No. 370,750

Claims priority, application Japan, Jun. 23, 1988, 63-153464; Jun. 23, 1988, 63-153465

Int. Cl.[5] B01D *21/26, 36/00*

U.S. Cl. 210—782 24 Claims

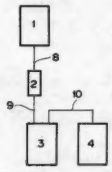
1. A method for separating blood into blood components, comprising the steps of:

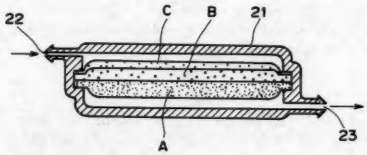
(a) providing blood collector means fluid-tightly connected to filter means for removing leukocytes or removing leukocytes and platelets from whole blood, said filter means being fluid-tightly connected to a primary bag through sealable, cuttable conduit means;

(b) collecting, from a donor, whole blood comprising plasma, erythrocytes, leukocytes and platelets;

(c) passing the whole blood through said filter means to produce a filtered blood containing the plasma, the erythrocytes and the platelets or containing the plasma and the erythrocytes;

(d) discharging the filtered blood from said filter means into said primary bag through said conduit means;
(e) sealing said conduit means at least at one portion intermediate ends thereof;
(f) cutting said conduit means portion to separate said conduit means into a filter means-side unsealed or sealed





conduit portion and a primary bag-side sealed conduit portion to thereby disconnect from said filter means said primary bag containing the filtered blood, said disconnected primary bag being sealed by virtue of said primary bag-side sealed conduit portion connected to said primary bag; and
(g) centrifuging the filtered blood in said primary bag.

4,985,154

PROCESS FOR THE EXTRACTION OF CRUDE OIL FROM AN UNDERGROUND DEPOSITE USING SURFACTANTS

Dieter Balzer, Haltern, and Harald Lueders, Recklinghausen, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 207,851, Jun. 17, 1988, abandoned. This application Mar. 26, 1990, Ser. No. 498,496
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720330
Int. Cl.[5] E21B *43/22*
U.S. Cl. 252—8.554 **12 Claims**

1. A process for the extraction of crude oil from an underground deposit which is penetrated by at least one injection well and at least one production well, said process comprising forcing a solution or a dispersion of a surfactant co-solvent mixture into said injection well, wherein said surfactant is an alkyl (poly)glycoside of formula (I)

$$R—O—Z_n$$

wherein R is a linear or branched, saturated or unsaturated C_{7-24} alkyl radical, and Z_n is an (oligo)-glycosyl radical having, on average, n = 1 to 10 hexose or pentose units or a mixture thereof.

4,985,155

SILICONE-CONTAINING FABRIC FINISHING AGENT

Koichiro Yamada, Fukui; Masaki Tanaka, Gunma; Toshio Ohba, Gunma, and Hiroshi Ohashi, Gunma, all of Japan, assignors to Nissin Chemical Industry Co., Ltd., Takefu, Japan

Filed Mar. 16, 1989, Ser. No. 324,070
Claims priority, application Japan, Mar. 17, 1988, 63-64396
Int. Cl.[5] D06M *15/00*
U.S. Cl. 252—8.6 **11 Claims**

1. A fabric finishing agent in the form of a solution in:
(A) a volatile inert organic solvent of
(B) a graft copolymer product of a graft copolymerization of from 5 to 95 parts by weight of
(a) an organopolysiloxane represented by the general formula

$$xo—(—SiR_2—O—)_m—(—SiYR—O—)_n—X,$$

in which each R is a substituted or unsubstituted monovalent hydrocarbon group of 1 to 20 carbon atoms, Y is a monovalent radical-polymerizable group or a monovalent organic group having a mercapto —SH group, X is a hydrogen atom, lower alkyl group or triorganosilyl group of the formula $R_2R^1Si—$, R having the same meaning as defined above and R^1 being R or Y, m is a positive integer not exceeding 10,000 and n is a positive integer, and from 95 to 5 parts by weight of
(b) an acrylic or methacrylic monomer represented by the general formula

$$CH_2=CR^2—CO—OR^3,$$

in which R^2 is a hydrogen atom or a methyl group and R^3 is an alkyl group or an alkoxy-substituted alkyl group having 1 to 18 carbon atoms, alone or as a mixture of monomers
(b-1) at least 70% by weight of which is an acrylic or methacrylic monomer (b) as defined above, and one or both of
(b-2) up to 30% by weight of which is an ethylenically unsaturated monomer containing one and only one radical-polymerizable ethylenically unsaturated group and at least one functional group in the molecule selected from the group consisting of hydroxy, hydroxy-terminated polyoxyalkylene, carboxyl, oxirane, amido, N-alkylolamido, N-(alkoxyalkyl)amino and amino groups and
(b-3) up to 20% by weight of which is another radical-polymerizable ethylenically unsaturated monomer different from monomers (b-1) and (b-2) defined above,
in the presence of a radical polymerization initiator and dissolved in component (A).

4,985,156

PRODUCTION OF BORATED ASHLESS DISPERSANTS

Henry Ashjian, E. Brunswick, and Henry A. Gawel, Clark, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 24, 1989, Ser. No. 426,610
Int. Cl.[5] C10M *139/00*
U.S. Cl. 252—49.6 **20 Claims**

1. The borated reaction product produced by reacting
(i) the maleic anhydride adduct of an olefinic alpha-olefin oligomer, said oligomer comprising oligomerizing C_2 to C_{24} alpha-olefin in the presence of a reduced Group VIB metal catalyst to produce an olefinic oligomer having a branch ratio of less than 0.19, with
(ii) a secondary amine;
(iii) an alkanol amine; and
(iv) a borating agent.

6. A process for the preparation of borated lubricant additive, comprising:
(i) oligomerizing C_2–C_{24} alpha-olefin in the presence of a

reduced Group VIB metal catalyst to produce olefinic oligomer having a branch ratio less than 0.19;
(ii) reacting said oligomer with maleic anhydride at elevated temperature to produce an alkenyl succinic anhydride;
(iii) reacting said alkenyl succinic anhydride with a secondary amine and an alkanolamine;
(iv) reacting step (iii) reaction product with a borating agent to produce a borated reaction product useful as a lubricant additive.

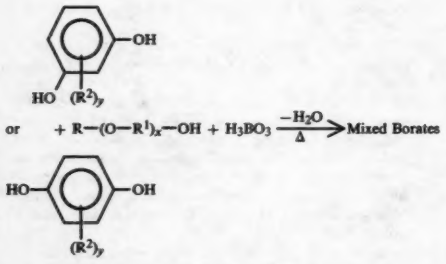
4,985,157

MIXED ALKOXYLATED ALCOHOL-HYDROQUINONE/RESORCINOL BORATES-ANTIOXIDANTS

Liehpao O. Farng, Lawrenceville; Andrew G. Horodysky, Cherry Hill; Robert E. Erahoffer, Sewell, and John A. Keller, Jr., Pitman, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed May 1, 1989, Ser. No. 346,031
Int. Cl.[5] C10M *103/00*
U.S. Cl. 252—49.6 **30 Claims**

1. A composition comprising a major amount of an oil of lubricating viscosity or grease or other solid lubricant prepared therefrom and a minor multifunctional antioxidant/antirust-/antiwear amount of from about 0.01 to about 10% by weight of the total composition of a mixed alkoxylated alcohol-hydroquinone or alkoxylated alcohol-resorcinol borate prepared as generally described below:



where R is C_1 to about C_{30} hydrocarbyl, R^1 is C_2 to about C_{20} hydrocarbyl or C_2 to about C_{20} containing sulfur, nitrogen, phosphorus and/or oxygen, R^2 is C_1 to about C_{30} hydrocarbyl or C_2 to about C_{30} hydrocarbyl containing sulfur, nitrogen, phosphorus and/or oxygen, x is an integer varying from 1 to about 20, and y is an integer varying from 0 to about 3 and where a boronating agent other than boric acid is used, said boronating agent being selected from the group consisting of metaborates and trialkyl borates.

17. A process of preparing mixed alkoxylated alcohol-hydroquinone/resorcinol borates suitable from use as multifunctional antioxidant/antirust/antiwear lubricant additives comprising reacting (1) a C_1–C_{30} hydrocarbyl hydroquione or resorcinol (2) an alkoxylated alcohol having the following generalized structure $R-(O-R^1)_x-OH$ where R is C_1 to about C_{30} hydrocarbyl, and R_1 is C_2 to about C_{20} hydrocarbyl or C_2 to about C_{20} hydrocarbyl containing sulfur, nitrogen, phosphorus and/or oxygen, and where x is an integer varying from 1 to about 20 or mixture thereof and (3) a boronating agent, said reaction being carried out at temperatures varying from 35° to about 250° C. at ambient or slightly higher pressure with molar quantities, less than molar quantities and more than molar quantities of said boronating agent.

4,985,158

LUBRICATING OIL COMPOSITION AND METHOD FOR SUPPLYING SAME

Hiroshi Kuwamoto; Yoshihiro Sakaguchi, both of Fukuyama; Hiroyuki Nagamori, and Yasuhiro Nakagawa, both of Wakayama, all of Japan, assignors to Kao Corporation and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

Division of Ser. No. 482,011, Apr. 4, 1983, which is a continuation of Ser. No. 142,826, Apr. 22, 1980, abandoned. This application Jul. 17, 1989, Ser. No. 380,540
Claims priority, application Japan, May 8, 1979, 54-55890; Mar. 10, 1980, 55-30155
The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.
Int. Cl.[5] C10M *173/02*
U.S. Cl. 252—49.3 **2 Claims**

1. A lubricating oil composition, comprising: as essential ingredients: (1) a lubricating oil component having a melting point no greater than 100° C. as a suspension in water containing (2) from 0.5 to 20 wt % based on the amount of said lubricating oil component of at least one water-soluble, anionic polymeric dispersant having a molecular weight of 250 to 25,000 as the sole dispersant.

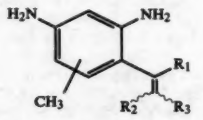
4,985,159

ALKENYLATED TOLUENEDIAMINES AS ANTIOXIDANTS FOR ORGANIC MATERIALS

William F. Burgoyne, Jr., Emmaus, Pa., and Dale D. Dixon, Venice, Fla., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 768,885, Aug. 23, 1985, Pat. No. 4,745,223, which is a continuation-in-part of Ser. No. 659,597, Oct. 11, 1984, abandoned, and a continuation-in-part of Ser. No. 837,461, Mar. 7, 1986, Pat. No. 4,714,778. This application Oct. 14, 1987, Ser. No. 108,332
The portion of the term of this patent subsequent to Dec. 22, 2005, has been disclaimed.
Int. Cl.[5] C10M *133/12*; C10L *1/22*
U.S. Cl. 252—50 **6 Claims**

1. In an organic material composition selected from rubber, oil, plastics and hydrocarbon fuels normally susceptible to gradual degradation in the presence of oxygen during use over an extended period of time and of the type in which an aromatic diamine has been added, the improvement which comprises: adding to the organic material a 2,4- or 2,6- toluenediamine composition having an alkenyl substituent ortho to an amino group represented by the formula:



wherein R_1, R_2, and R_3 are selected from the group consisting of hydrogen, C_1 aliphatic, R_1 is bridged via an alkylene radical $-(CH_2)_y-$ with R_2 to form a ring wherein y=2 to 5 and provided in said group at least one R_1, R_2 and R_3 is C_1.

4,985,160

BRANCHED POLYMERS AS FUEL OIL ADDITIVES

Cyrus P. Henry, Claymont, and Harry J. Spinelli, Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 8, 1989, Ser. No. 307,500
Int. Cl.[5] C10M *145/14*
U.S. Cl. 252—51.5 R **18 Claims**

1. An oil soluble, basic amine-containing copolymer comprised of an addition-type polymeric main chain and a plurality

of addition-type polymeric branches extending from the side thereof,

wherein the main polymer chain is comprised of monomeric units derived from one or more polymerizable ethylenically unsaturated monomers with each monomer containing only one polymerizable ethylenic linkage and the main chain is free of individual basic hydrocarbon amine group monomeric substituents and comprises from about 50 to 99.5% by weight of the copolymer, and

the polymeric side branches are comprised of monomeric units derived from one or more polymerizable ethylenically unsaturated monomers with each monomer containing only one polymerizable ethylenic linkage, and from about 10 to 100% of the monomeric units in the branches contain a basic amine group and the branches comprise from about 0.5 to 50% by weight of the copolymer.

4,985,161

FLUORINE-CONTAINING GREASE AND ITS PREPARATION

Takashi Tohzuka; Yoshiaki Kataoka, both of Osaka; Sueyoshi Ishikawa, Kishiwada, and Koji Fujiwara, Toyonaka, all of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Continuation of Ser. No. 347,015, May 4, 1989, abandoned. This application May 17, 1990, Ser. No. 525,303

Claims priority, application Japan, May 6, 1988, 63-110979; May 11, 1988, 63-115414

Int. Cl.[5] C10M *107/38*

U.S. Cl. 252—54 **9 Claims**

1. A fluorine-containing grease comprising a perfluoroalkyl polyether and polytetrafluoroethylene, wherein the perfluoroalkyl polyether and polytetrafluoroethylene are used in a weight ratio of 50:50 to 90:10 and which is prepared by polymering tetrafluoroethylene in the presence of said perfluoroalkyl polyether.

4,985,162

DEWATERING COMPOSITION

Robert Cole, Roanoke, Va., assignor to Wen-Don Corporation, Roanoke, Va.

Filed Jan. 6, 1989, Ser. No. 293,914

Int. Cl.[5] C09K *3/00*

U.S. Cl. 252—60 **15 Claims**

1. A dewatering composition consisting essentially of about 5 to 40 weight percent of a sulfosuccinate, about 5 to 40 weight percent of a non-ionic surfactant, and an effective amount of silicone a foam control agent.

4,985,163

SHAPED HEAT-INSULATING BODY AND PROCESS OF MAKING THE SAME

Günter Kratel, Durach-Bechen, and Hans Katzer, Kempten, both of Fed. Rep. of Germany, assignors to Consortium fur Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 193,768, Oct. 3, 1980, abandoned. This application Jun. 4, 1986, Ser. No. 873,285

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946476

Int. Cl.[5] C04B *33/32*; E04B *1/74*

U.S. Cl. 252—62 **19 Claims**

1. A method of making a shaped heat-insulating body based on water-insoluble oxidic metal compounds, clouding agents and other additives, comprising the steps of:

(a) mixing in a dry state with maintenance of the structure of the compounds, 100 parts by weight of water-insoluble oxidic metal compounds having a BET-surface of 10 to 700 m^2/g wherein at least 5% by weight of the total weight of these compounds have a BET-surface of at least 50 m^2/g said water-insoluble oxidic metal compounds being selected from the group consisting of silicon and aluminum compounds;

0 to 100 parts by weight of mineral clouding agents having at least one absorption maximum in the wave length range of 1.5 to 10 μm; and

about 0.1 to 30 parts by weight of an additive selected from the group consisting of borides, boron carbide, and a combination thereof capable of forming a solid oxide with a standard formation enthalpy of less than minus 900 kJ/Mol.;

(b) transferring the mixture into a mold of desired shape;

(c) compressing the mixture to density of between 0.15 to 1 g/cm^3; and

(d) heating to temperatures of between 200° to 900° C., so that a chemical reaction will take place, thereby obtaining a thermally hardened, non-vitreous body having a porosity of 50–90%, calculated on the total volume of the body, which has a heat conductivity of 0.02 to 0.1 W/Km at temperatures of approximately 300° to 500° C.

4,985,164

FORSTERITE AND ITS USE AS INSULATING MATERIAL

Pierre Delvaux, Bromptonville; Luc Desrosiers, Rock Forest, and Marcel Gouin, Deauville, all of Canada, assignors to Ceram-Sna Inc., Sherbrooke, Canada

Filed Sep. 16, 1988, Ser. No. 246,198

Int. Cl.[5] E04B *1/74*

U.S. Cl. 252—62 **1 Claim**

1. A fibrous synthetic forsterite obtained by the calcination of chrysotile asbestos fiber at a temperature of from 650° to 1450° C., said synthetic forsterite being characterized by having an $MgO:SiO_2$ ratio lower than 1.1, a raw loose density of from 3 to 40 pcf, a thermal conductivity "k" factor of from 0.25 to 0.40 BTU. In/Hr.°F.Ft^2 and a fusion point of from 1600° to 1700° C.

4,985,165

MATERIAL HAVING A PREDETERMINABLE MAGNETIC SUSCEPTIBILITY

Scato Albarda, Am Bruchem, Netherlands; Helge Frank, and Joachim Marcoll, both of Lübeck, Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Nov. 28, 1989, Ser. No. 442,299

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1988, 3840848

Int. Cl.[5] C04B *35/04*

U.S. Cl. 252—62.54 **8 Claims**

1. A rigid material having a magnetic susceptibility, the material comprising:

a plastic mass as primary substance and binding agent,

an additive substance including a paramagnetic material having a first magnetic susceptibility and a plurality of small hollow balls made of a material having a second magnetic susceptibility less than said first magnetic susceptibility;

said small hollow balls having a diameter smaller than the size of a workpiece made of the material; and,

said plastic mass and said additive substance being mixed in a mixing ratio for forming a rigid structure for the workpiece.

4,985,166

MAGNETIZABLE COMPOSITE PARTICLES BASED ON CROSS-LINKED ORGANOPOLYSILOXANE, PROCESS FOR PREPARATION THEREOF AND THEIR APPLICATION IN BIOLOGY

Frederic Leising, Mornant, and Ghislaine Torres, Lyon, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Continuation of Ser. No. 285,756, Dec. 16, 1988, abandoned. This application Jun. 12, 1990, Ser. No. 536,954

Claims priority, application France, Dec. 18, 1987, 87 17718

Int. Cl.[5] H01F *1/26, 1/28;* C12N *11/08, 11/14*

U.S. Cl. 252—62.54 17 Claims

1. Magnetizable composite particles, comprising

a matrix based on a crosslinked organopolysiloxane obtained from the hydrosilylation of:

at least one organopolysiloxane SiVi containing, per molecule, at least two vinyl groups each linked to a silicon atom, said organopolysiloxane having a viscosity ranging from 20 to 30,000,000 mPas at 25° C.;

with at least one organohydrogenopolysiloxane SiH containing, per molecule, at least three hydrogen atoms each linked to a silicon atom, said organohydrogenopolysiloxane having a viscosity ranging from 5 to 1,500 mPas at 25° C.; and

encapsulated in said matrix, magnetizable components having a diameter less than 300 angstroms, said components being coated with a non-water-soluble dispersing agent.

4,985,167

LOW-LOSS OXIDE MAGNETIC MATERIAL

Hikohiro Togane, Sagamihara, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1989, Ser. No. 381,302

Claims priority, application Japan, Jul. 18, 1988, 63-178718; Aug. 19, 1988, 63-205990

Int. Cl.[5] C04B *35/38*

U.S. Cl. 252—62.58 3 Claims

1. A low-loss Mn-Zn ferrite magnetic material consisting essentially of:

52–56 mol% of Fe_2O_3, 32–42 mol% of MnO and 5–15 mol% of ZnO,

10–70 ppm of P, 100–300 ppm of SiO_2 and 200–2,000 ppm of CaO,

and exhibiting a smaller loss of electrical power than said ferrite material as defined above but where P is less than 10 ppm or greater than 70 ppm.

2. A low-loss Mn-Zn ferrite magnetic material consisting essentially of:

52–56 mol% of Fe_2O_3, 32–42 mol% of MnO and 5–15 mol% of ZnO,

10–130 ppm of Al, 100–300 ppm of SiO_2 and 200–2,000 ppm of CaO,

and exhibiting a smaller loss of electrical power than said ferrite material as defined above but where Al is less than 10 ppm or greater than 130 ppm.

3. A low-loss Mn-Zn ferrite magnetic material consisting essentially of:

52–56 mol% of Fe_2O_3, 32–42 mol% of MnO and 5–15 mol% of ZnO,

10–100 ppm of Cr, 100–300 ppm of SiO_2 and 200–2,000 ppm of CaO,

and exhibiting a smaller loss of electrical power than said ferrite material as defined above but where Cr is less than 10 ppm or greater than 100 ppm.

4,985,168

WORKING FLUIDS

Yukio Ohmure, Takatsuki; Hiroshi Kashiwagi, Settsu; Katsuki Fujiwara, Suita; Tatsumi Tsuchiya, Neyagawa, and Hirokazu Aoyama, Takatsuki, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Apr. 27, 1990, Ser. No. 515,732

Claims priority, application Japan, Apr. 27, 1989, 64-111276; May 14, 1989, 64-132475; May 24, 1989, 64-132474

Int. Cl.[5] C09K *5/04*

U.S. Cl. 252—67 7 Claims

1. A working fluid comprising 3-chloro-1,1,1,2,2-pentafluoropropane and 1-chloro-1,1,3,3,3-pentafluoropropane.

4,985,169

COMPOSITIONS BASED ON CHLOROFLUORINATED ETHER AND SOLVENT AND THEIR APPLICATION IN ABSORPTION APPARATUS

Laurence Rolland, Sceaux; René Bertoochio, Vourles Par Vernaison, and Jacques Cheron, Maisons Laffite, all of France, assignors to Atochem, Gas de France and Institut Francais du Petrole, both of, France

Division of Ser. No. 264,072, Oct. 28, 1988. This application Apr. 6, 1990, Ser. No. 506,541

Claims priority, application France, Oct. 30, 1987, 87 15095; Oct. 30, 1987, 87 15101

Int. Cl.[5] C09K *5/00;* F25B *5/00*

U.S. Cl. 252—69 7 Claims

1. A method of operating a thermal absorption apparatus which generates heat and/or cold in a closed circuit wherein the working fluid comprises a mixture of fluids comprising 1-difluoromethoxy-1,1,2-trifluoro-2-chloroethane and at least one solvent selected among aromatic esters and the ω,ω'-dialkylated polyoxyethylene glycols.

4,985,170

IN BETA-PHASE BAR FORM CONTAINING SOAP, HIGH HLB NONIONIC SURFACTANT, AND WATER-SOLUBLE POLYMER

Geoffrey G. Dawson, Ponteland, and Gordon Ridley, Cramlington, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 5, 1988, Ser. No. 253,808

Claims priority, application United Kingdom, Oct. 9, 1987, 8723776

Int. Cl.[5] C11D *9/30, 13/14*

U.S. Cl. 252—117 17 Claims

1. A beta-phase toilet bar composition comprising:

(a) from about 45% to about 90% by weight of soluble alkali metal soap of C_8–C_{24} fatty acids,

(b) from 0.5% to about 45% of an ethoxylated nonionic surfactant having an HLB in the range from about 12 to about 19.5, and

(c) from about 0.01% to about 5% of a water-soluble cationic polymer.

4,985,171

ANTHRAQUINONE TYPE COMPOUND AND LIQUID CRYSTAL COMPOSITION CONTAINING SUCH COMPOUND

Konoe Miura, Yokohama; Tetsuo Ozawa, Hatano, and Junko Kanaya, Akita, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

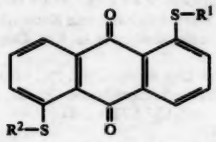
Continuation of Ser. No. 71,791, Jun. 18, 1987, abandoned. This application Jan. 2, 1990, Ser. No. 459,958

Claims priority, application Japan, Oct. 29, 1985, 60-243601; Oct. 29, 1985, 60-243602; Oct. 29, 1985, 60-243603; Dec. 23, 1985, 60-290240

Int. Cl.[5] C09K *19/00;* G02F *1/13;* C07D *401/00, 475/00*

U.S. Cl. 352—299.1 8 Claims

1. An anthraquinone type compound which is represented by the following general formula



wherein R^1 represents a pyridyl group, a pyrimidyl group or a lower alkyl substituted pyrimidyl group and R^2 indicates a 4-substituted phenyl group selected from the group consisting of a 4-alkyl phenyl group, 4-alkoxy phenyl group, a biphenyl group, a 4-cyclohexyl-phenyl group and a trans-4-alkyl cyclohexyl phenyl group wherein said alkyl or alkoxy substituents have a carbon content of C1-18.

4,985,172

CHIRAL ARYLOXYPROPIONATES, AND THE USE THEREOF AS DOPES IN LIQUID-CRYSTAL PHASES

Rainer Wingen, Hattersheim am Main; Hans-Rolf Dübal, Hofheim am Taunus; Wolfgang Hemmerling, Sulzbach; Ingrid Müller, Hofheim am Taunus, and Dieter Ohlendorf, Liederbach, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

PCT No. PCT/EP87/00653, § 371 Date May 5, 1989, § 102(e) Date May 5, 1989, PCT Pub. No. WO88/03525, PCT Pub. Date May 19, 1988

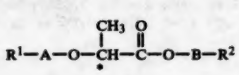
PCT Filed Nov. 2, 1987, Ser. No. 359,747

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1986, 3638119

Int. Cl.[5] C09K *19/20*; C07D *239/02*; C07C *69/76*

U.S. Cl. 252—299.67 9 Claims

1. A chiral aryloxypropionate of the formula



wherein R^1 is a straight-chain alkyl or alkoxy of 7 to 16 carbon atoms, A is selected from the group consisting of phenylene, biphenylene, pyrimidylphenyl, phenylcarbonyloxyphenyl and (phenylcarbonyloxy)-phenylcarbonyloxy) phenyl and B is a chemical bond or a phenylene, biphenylene or pyrimidinephenyl and a) if B is a chemical bond, R^2 is an alkyl of 2 to 10 carbon atoms which contains an asymmetrical carbon atom substituted by $—CH_3$, halogen or a $—COOC_2H_5$ or an alkyl of 3 to 10 carbon atoms which contains two adjacent, asymmetrical carbon atoms of which one is substituted by halogen and the other by a $—CH_3$, or which, together with an O, form an oxirane ring, of (b) if B is one or two aromatic or heteroaromatic rings linked directly to one another, R^2 is a chiral alkoxy of 2 to 10 carbon atoms which contains an asymmetrical carbon atom substituted by CH_3, halogen or a $—COOC_2H_5$ or R^2 is an alkoxy of 3 to 10 carbon atoms which contains two adjacent, asymmetrical carbon atoms, of which one is substituted by halogen and the other by a CH_3, or which, together with an O-atom form an oxirane ring.

4,985,173

PROCESS FOR PRODUCING A W/O/W TYPE MULTIPLE EMULSION FOR MEDICINES, COSMETICS, ETC.

Yasuyuki Takahashi; Toshiro Yoshida, and Takeshi Takahashi, all of Tokyo, Japan, assignors to Meiji Milk Products Company Limited, Tokyo, Japan

Continuation of Ser. No. 247,115, Sep. 19, 1988, which is a division of Ser. No. 795,357, Oct. 15, 1985, abandoned. This application May 29, 1990, Ser. No. 530,053

Claims priority, application Japan, Mar. 26, 1984, 59-056324

Int. Cl.[5] B01J *13/00*; A61K *31/20*

U.S. Cl. 252—314 1 Claim

1. A process for producing a W/O/W type multiple emulsion for the production of medicines and cosmetics comprising the steps of:

(a) adding an emulsifying amount of polyglycerol polyricinoleate to an oil phase;

(b) forming an O/W emulsion by adding the product obtained by step (a) to an aqueous phase;

(c) inverting said O/W emulsion of step (b) into a W/O emulsion by agitating;

(d) forming the W/O/W emulsion by adding said W/O emulsion obtained by step (c) to an outer aqueous phase; and

(e) wherein a medicine or cosmetic is included within the W/O/W/ emulsion.

4,985,174

RETICULOCYTE QUANTITATING REAGENT FOR FLOW CYTOMETRY

Tomoyuki Kuroda, and Takahito Fukuhara, both of Hyogo, Japan, assignors to TOA Medical Electronics Co., Ltd., Kobe, Japan

Continuation of Ser. No. 807,173, Dec. 9, 1985, abandoned. This application Dec. 4, 1987, Ser. No. 129,912

Claims priority, application Japan, Jun. 6, 1985, 60-123128

Int. Cl.[5] G01N *21/64*, *31/02*

U.S. Cl. 252—408.1 8 Claims

1. A method for quantitating reticulocytes in a fresh blood sample stained with auramine O by flow cytometry comprising the steps of:

(a) fluorescent staining RNA in blood cells of the fresh blood sample for a period of about ten minutes with a composition of auramine O, said composition containing 20 to 2500 μg/ml of auramine O, alkaline metal salt in an amount sufficient to stabilize the shape of the blood cells, and buffer to maintain the pH of the composition at a value in the range of 6 to 10;

(b) flowing said stained cells through a detecting area of a flow cytometer having a light source with a suitable excitation wavelength;

(c) detecting scattered light and fluorescence above 520 nm emitted from cells;

(d) distinguishing platelets from cells by said detected scattered light;

(e) discriminating mature erythrocytes, reticulocytes, and leucocytes by RNA content using auramine O fluorescence; and

(f) calculating the ratio of reticulocytes to the total erythrocytes and/or relative RNA content in a unit volume of fresh blood and/or relative RNA content in a unit volume of fresh blood.

5. A method for quantitating reticulocytes in a fresh blood sample stained with auramine O by flow cytometry comprising the steps of:

(a) fluorescent staining RNA in blood cells of the fresh blood sample for a period of about thirty seconds with a composition of auramine O, said composition containing 20 to 2500 μg/ml of auramine O, alkaline metal salt in an amount sufficient to stabilize the shape of the blood cells, and buffer to maintain the pH of the composition at a value in the range of 6 to 10;

(b) flowing said stained cells through a detecting area of a flow cytometer having a light source with a suitable excitation wavelength;
(c) detecting scattered light and fluorescence above 520 nm emitted from cells;
(d) distinguishing platelets from cells by said detected scattered light;
(e) discriminating mature erythrocytes, reticulocytes and leucocytes by RNA content using auramine O fluorescence; and
(f) calculating the ratio of reticulocytes to the total erythrocytes and/or the numbers of reticulocytes in a unit volume of fresh blood and/or relative RNA content in a unit volume of fresh blood.

4,985,175

ELASTOMER-MODIFIED CARBON-CONTAINING POLYARYLENE SULFIDE BLENDS

Hans-Jürgen Dziuba, Leverkusen; Klaus Reinking, Wermelskirchen; Wolfgang Wehnert, and Erhard Tresper, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 14, 1989, Ser. No. 393,217
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1988, 3828696
Int. Cl.[5] C08K *3/04*
U.S. Cl. 252—506 10 Claims

1. Conductive blends of
(a) 20 to 82% by weight of polyarylene sulfide,
(b) 4 to 60% by weight of conductive carbon black,
(c) 4 to 60% by weight of graphite,
(d) 1 to 60% by weight of a graft polymer of
(A) 25 to 95 parts by weight of a copolymer of
(a) 75 to 99.8 parts by weight of a C_1–C_6-alkyl acrylate,
(b) 0.1 to 5 parts by weight of a monomer containing at least 2 non-conjugated olefinic double bonds and
(c) 0 to 40 parts by weight of an unsaturated monomer other than (a) and (b) and
(B) 75 to 5 parts by weight of a resin which has been obtained by polymerisation of at least one olefinically unsaturated monomer and has been produced in the presence of (A),
the sum of the percentages by weight of constituents (a)+(b)+(c)+(d) being in each case 100% by weight, and optionally other standard fillers and reinforcing materials.

4,985,176

RESISTIVE PASTE

Shizuharu Watanabe, Kyoto; Hiroji Tani, Nagaokakyo, and Tohru Kasanami, Tsuzuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 2, 1988, Ser. No. 279,529
Claims priority, application Japan, Dec. 4, 1987, 62-307821; Dec. 4, 1987, 62-307822; Dec. 4, 1987, 62-307823
Int. Cl.[5] H01B *1/06*
U.S. Cl. 252—521 12 Claims

1. A resistive paste consisting essentially of an inorganic solid component suspended in an organic vehicle, said inorganic solid component consisting essentially of at least one metal hexaboride, 5 to 30 weight % of at least one nitride selected from the group consisting of aluminum nitride and boron nitride, and a vitreous binder composed of a glass frit consisting essentially of alkaline earth metal borosilicate and 0.5 to 5.0 mol % of niobium oxide.

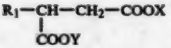
4,985,177

CONTAINING A SUCCINIC ACID DERIVATIVE

Masaki Tosaka; Haruki Kawano, and Katsuhiko Deguchi, all of Utsunomiya, Japan, assignors to Kao Corporation, Tokyo, Japan

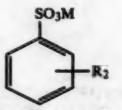
Filed Oct. 4, 1989, Ser. No. 417,038
Claims priority, application Japan, Oct. 21, 1988, 63-265719
Int. Cl.[5] C11D *1/831, 1/04*
U.S. Cl. 252—547 4 Claims

1. A concentrated liquid detergent composition comprising the following components (a)–(d):
(a) a sulfate anionic or sulfonate anionic surface active agent,
(b) a nonionic or amphoteric surface active agent,
(c) a succinic acid derivative represented by the following formula (I):



(I)

wherein R_1 is an alkyl or alkenyl group having 10–14 carbon atoms, X and Y individually represents a hydrogen atom, an alkali metal, an ammonium ion, or an alkanol amine, and
(d) a lower alkylbenzenesulfonate represented by the following formula (II):



(II)

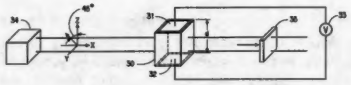
wherein R_2 is a hydrogen atom or an alkyl group having 1–5 carbon atoms, M represents an alkali metal, an ammonium ion, or an alkanol amine; and wherein the content of (a)+(b) is 40–60% by weight, the ratio by weight of (a)/(b) is 0.5–10, the ratio by weight of (d)/(c) is 2–20, and the ratio by weight of [(c)+(d)]/[(a)+(b)] is 0.05–0.3.

4,985,178

NONLINEAR OPTICAL DEVICE FROM 3-METHYL-4-METHOXY-4'-NITROSTILBENE

Wilson Tam, Boothwyn, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 7,275,153, Nov. 22, 1988, abandoned. This application Sep. 1, 1989, Ser. No. 401,871
Int. Cl.[5] F21V *9/04;* C07C *205/00;* G02B *6/10, 6/00*
U.S. Cl. 252—587 8 Claims



1. The nonlinear optically active compound 3-methyl-4-methoxy-4'-nitrostilbene.

4,985,179

OPTICAL MATERIAL

Iwao Seo; Kenji Nakajima, and Manabu Kishimoto, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed May 31, 1989, Ser. No. 359,279
Claims priority, application Japan, May 31, 1988, 63-133701
Int. Cl.[5] G02B *1/04, 1/02*
U.S. Cl. 252—587 5 Claims

1. An optical material obtained by electrically polarizing a

high polymer molded article obtained from a composition comprising an alternating copolymer of vinylidene cyanide and at least one comonomer selected from vinyl compounds and other vinylidene compounds having uniformly dispersed therein from 0.1 to 70% by weight of an organic molecular crystal having nonlinear optical effects such that the secondary molecular nonlinear susceptibility of the organic molecular crystals is at least 1×10^{-3} esu, with the total amount of the copolymer and the organic molecular crystal being 100% by weight.

4,985,180

PROCESS FOR PREPARING PHENYL ESTERS OF SUBSTITUTED ACIDS

Harold E. Bellis; Donald J. Dumas; George C. Sonnichsen, all of Wilmington, Del., and Vinayakam Subramanyam, Boothwyn, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 219,644, Jul. 15, 1988, abandoned. This application Jun. 6, 1989, Ser. No. 359,981

Int. Cl.[5] C11C *3/00*; C07C *69/017*

U.S. Cl. 260—404 **11 Claims**

1. A process for preparing a compound of the formula:

$$R—ACH(R_1)CO_2Ph(CH_2)_n—R_2$$

wherein

A is $CO_2(CH(R_1)CO_2)_m$, S, $N(R_4)_2^+$, $P(R_5)_2^+$ or $CON(R_6)$;

R is C_1–C_{20} alkyl; alkoxylated alkyl, cycloalkyl, aryl or alkylaryl;

R_1 is H or CH_3;

R_2 is SO_3M, OSO_3M, CO_2M, or $N^+(R_3)_3Q^-$;

n is 0 or an integer from 1 to 4;

m is 0 or an integer from 1 to 4;

M is H, an alkali metal, an alkaline earth metal, or $N(R_3)_4^+$;

R_3 substituents are independently H or C_1–C_6 alkyl;

R_4 substituents are independently H or C_1–C_{20} alkyl;

R_5 substituents are independently C_1–C_{20} alkyl;

R_6 is H or C_1–C_{10} alkyl, aryl or alkylaryl; and

Q is a halide

with the proviso that when A is $CO_2(CH(R)CO_2)$ then R_2 is SO_3M, OSO_3M or $N^+(R_3)_3Q^-$; which comprises, in a first step, treating a phenol derivative of the formula:

$$M_1—OPh(CH_2)_n—R_2$$

with an acid halide of the formula:

$$X—CH(R_1)CO—Y$$

in the optional presence of a solvent and optional presence of a phase transfer catalyst to yield a phenyl ester intermediate of the formula:

$$X—CH(R_1)CO_2Ph(CH_2)_n—R_2$$

and, in a second step, reacting the intermediate in the optional presence of a solvent with a nucleophile of the formula:

$RCO_2(CH(R_1)CO_2)_mM_2$, RSM_2, $RN(R_2)_2$, $RP(R_4)_2$ or $RCON(R_5)M_2$

wherein

X and Y are independently Cl or Br; and

M_1 and M_2 independently have the same meaning as M.

4,985,181

CENTRIFUGAL PUMP ESPECIALLY FOR AQUARIUMS

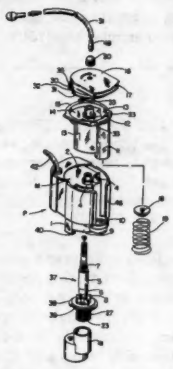
Antonio Strada, Rubano, Italy; Alain Bertschy, Sarrebourg, France; Giacomo Guoli, Milan, Italy, and Edmund J. Mowka, Jr., Mentor, Ohio, assignors to Newa S.r.l., Italy

Filed Oct. 23, 1989, Ser. No. 425,295

Claims priority, application Italy, Jan. 3, 1989, 84101/89[U]; Jan. 3, 1989, 84102/89[U]; Jan. 3, 1989, 84103/89[U]

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—87 **44 Claims**



1. A submersible water pump especially for aquariums comprising a pump body having a water inlet, a water outlet, water passage means between said inlet and outlet, pump means for pumping water from said inlet through said passage means to said outlet, and visual indicating means on said pump body for visually indicating the water flow rate through said pump.

4,985,182

PACKING ELEMENT

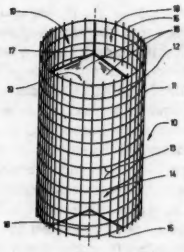
Hartwig Basse, and Jürgen Wittek, both of Nordenham, Fed. Rep. of Germany, assignors to Norddeutsche Seekabelwerke Aktiengesellschaft, Nordenham, Fed. Rep. of Germany

Continuation of Ser. No. 215,487, Jul. 6, 1988, abandoned. This application Nov. 1, 1989, Ser. No. 430,065

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723804

Int. Cl.[5] B01J *19/30*

U.S. Cl. 261—94 **10 Claims**



1. A packing element comprising:

a cylindrical outer cover (11) having a longitudinal axis and a net-like construction; and

at least one closed guiding surface inside said net-like outer cover (11) and dividing said cover into several subspaces;

wherein said outer cover (11) has longitudinal web ribs (12), running in the longitudinal direction of said cover, and annular ribs (13) running perpendicularly to said web ribs, thus forming approximately square net openings (14) in the cylindrical surface of said cover (12);

the guiding surface (16, 20, 21) pointing longitudinally towards said outer cover (11) and being joined to a longitudinal web rib (12) of said outer cover (11);

the cylindrical surface area encompassed by said square net openings being larger than that encompassed by said web ribs (12) and said annular ribs (13).

4,985,183

UO2 PELLET FABRICATION PROCESS

Tadao Yato, Mito, and Hiroshi Tanaka, Omiya, both of Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Jul. 6, 1989, Ser. No. 375,881

Claims priority, application Japan, Dec. 27, 1988, 63-330340

Int. Cl.[5] G21C *21/00*

U.S. Cl. 264—0.5 11 Claims

1. A process for fabricating uranium dioxide (UO_2) pellets from highly active uranium dioxide powders, comprising:

(1) uniformly adding at least one pore-former agent in the range of 0.3 to 1.4% by weight to uranium dioxide powders as a starting material, the pore-former agent decomposing and sublimating below 600° C. and having an average particle size in the range of 5 to 500 microns,

(2) compacting the uranium dioxide powders including the pore-former agent to form green pellets, and

(3) sintering the green pellets to form sintered UO_2 pellets having an average crystalline grain size larger than 20 microns.

4,985,184

PRODUCTION OF CARBONACEOUS POWDERS AND THEIR GRANULATION

Kunimasa Takahashi; Takashi Kameda; Masato Yoshikawa, and Teruo Teranishi, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Sep. 19, 1988, Ser. No. 246,272

Claims priority, application Japan, Sep. 18, 1987, 62-234647; Oct. 14, 1987, 62-259188

Int. Cl.[5] B29B *9/00;* C01B *31/02*

U.S. Cl. 264—6 5 Claims

1. In a process for granulating a carbonaceous pulverulent body by spray-drying a slurry in heated air which can contain superheated steam, which slurry has a carbonaceous pulverulent body comprising a self-sintering carbonaceous pulverulent body dispersed in water in the presence of at least a binding agent and a wetting agent, the improvement which comprises:

(1) employing, as said binding agent, a water-soluble organic compound which does not produce a foamed structure when carbonized at 1000° C. under an inert atmosphere and which provides a residual carbon yield of 10% by weight or more when carbonized at 1000° C. under an inert atmosphere, and the amount of said agent ranging in proportion from 0.01 to 5 parts by weight to 100 parts by weight of the carbonaceous pulverulent body; and

(2) employing, as said wetting agent, a non-ionic surfactant having a clouding point of at least 25° C., and the amount of said agent ranging in proportion from 0.01 to 3 parts by weight to 100 parts by weight of the carbonaceous pulverulent body, thereby producing a granulated carbonaceous pulverulent body in the form of spherical particles which, upon contact with water, form a slurry which can be spray-dried.

4,985,185

METHOD FOR MANUFACTURING AN OPTICAL CABLE

Ernst Mayr, Starnberg, and Ulrich Oestreich, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 10, 1989, Ser. No. 321,795

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3808037

Int. Cl.[5] B29D *11/00*

U.S. Cl. 264—1.5 10 Claims

1. A method for manufacturing optical cables having a central element with at least one open chamber receiving at least one light waveguide having an excess length and a filling compound, said method comprising the steps of providing the central element having the open chamber, and simultaneously introducing the light waveguide with a filling compound into the chamber in a single step including guiding the waveguide and filling compound through a common filling tube to be discharged from an end of the tube into the open chamber.

4,985,186

PROCESS FOR PRODUCING OPTICAL ELEMENT

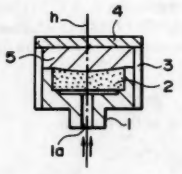
Noriyuki Nose, Sagamihara; Toshiyuki Nakajima, Atsugi; Eigo Kawakami, Atsugi; Takeshi Baba, Atsugi; Nobuo Kushibiki, Ebina; Masakazu Matsugu, and Yukichi Niwa, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1987, Ser. No. 35,773

Claims priority, application Japan, Apr. 11, 1986, 61-83761; Apr. 11, 1986, 61-83764; May 1, 1986, 61-99490

Int. Cl.[5] B29D *11/00*

U.S. Cl. 264—1.7 15 Claims



1. A process for producing an optical element utilizing a rigid holder, which comprises the steps of:

pouring an uncured optical raw material into said holder having a rigid mold surface to form said optical element in contact with the mold surface, and a porous material insert as part of the rigid mold surface, said porous material insert having a shape-defining rigidity;

curing said optical raw material to thereby form said optical element in substantial contact with said mold surface; and

supplying a gas through said porous material to a boundary between the optical element and the mold surface to thereby release the optical element from the mold.

4,985,187

METHOD FOR COLORING PLASTIC GRANULES BY MIXING WITH COLORING AGENT AT AMBIENT TEMPERATURE

Richard F. T. Bes, and Jan D. Knol, both of Apeldoorn, Netherlands, assignors to Holland Colours Apeldoorn BV, Netherlands

Filed May 3, 1988, Ser. No. 189,763
Claims priority, application Netherlands, May 4, 1987, 8701051
Int. Cl.[5] B29B 7/00
U.S. Cl. 264—13 12 Claims

1. Method for preparing colored plastic particles, comprising the steps of:

mixing plastic granulate particles with coloring agent composition particles such that coloring agent composition is rubbed onto the surface of the plastic granulate particles until the surface of the plastic granulate particles is saturated with the coloring agent composition;

wherein the coloring agent composition particles are obtained by mixing coloring agent particles and a molten carrier, which is solid at ambient temperature, followed by dispersion of the mixture to form substantially spherical particles prior to solidification of the mixture; and

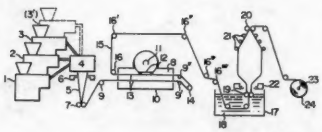
while mixing the plastic granulate particles with the coloring agent composition particles and while rubbing the coloring agent composition onto the surface of the plastic granulate particles, maintaining the plastic granulate particles and the coloring agent composition particles at a temperature which is less than the melting point of the carrier.

4,985,188

PROCESS FOR PRODUCING CROSS-LINKED LAMINATED FILM

Tadashi Ishio, and Daisuke Matsumura, both of Suzuka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 124,796, Oct. 22, 1987, Pat. No. 4,863,768.
This application Aug. 1, 1989, Ser. No. 388,107
Claims priority, application Japan, Jun. 19, 1986, 61-141345
Int. Cl.[5] B29C 71/04
U.S. Cl. 264—22 12 Claims



1. A process for producing a cross-linked laminated film which comprises:

(a) forming a laminate by disposing at least one polyolefin resin layer (II) on one side of an oxygen barrier core layer (I); and the disposing an adhesive shrinkable resin layer (III) and sealing resin layer (IV) in this order on the other side od said core layer (I),

(b) irradiating an electron beam to said laminate from the surface side of the layer (II) so as to cause the layer (II) to have a gel fraction x at the outside portion of 25–70% by weight, a gel fraction y at the inner portion contacting the side of the layer (I) of 40% by weight or less, and a gradient of gel fraction represented by y/x of 0.6 or less, without cross-linking the layer (IV), an

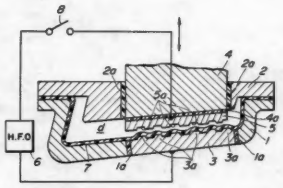
(c) stretching the thus cross-linked laminate.

4,985,189

METHOD OF PRODUCING A SKIN-COVERED PAD FOR A SEAT

Takashi Sugiura; Ichiro Matsuura; Fumio Miyauchi, and Toyoharu Chiyoshi, all of Ayase, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed May 26, 1988, Ser. No. 199,344
Int. Cl.[5] B29C 51/00
U.S. Cl. 264—26 5 Claims



1. A method of producing a skin-covered pad for a seat, comprising:

(a) preparing a lower mold which has a cavity formed therein, said lower mold having at its bottom a first electrode mounted thereto through an insulator, said first electrode having a plurality of projections which are exposed to said cavity;

(b) putting a bag-shaped outer skin member into said cavity, said skin member being thermally plastic;

(c) putting an upper mold on said lower mold to close said cavity, said upper mold having an aperture formed therethrough;

(d) projecting a press member into said cavity through said aperture, said press member having at its work head a second electrode secured thereto through an insulator, said second electrode having at its front face recesses which are shaped to match with said projections of the first electrode;

(e) pressing the face of the second electrode against the projections of the first electrode with a part of the outer skin member placed therebetween;

(f) applying a high frequency current between said first and second electrodes thereby to heat and thus soften said part of the outer skin member;

(g) separating the face of the second electrode from the projections of the first electrode;

(h) pouring a liquid material for foamed plastic into said cavity and curing the same.

4,985,190

METHOD FOR MOLDING A FILLER-CONTAINING POLYTETRAFLUOROETHYLENE

Takamichi Ishikawa; Masumi Nomura, both of Yokohama, and Masuho Takeuchi, Tokyo, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jun. 1, 1989, Ser. No. 359,580
Claims priority, application Japan, Jun. 3, 1988, 63-135639
Int. Cl.[5] B29C 47/00
U.S. Cl. 264—122 7 Claims

1. A method for extrusion molding dense, filler-containing polytetrafluoroethylene free from large pores, comprising:

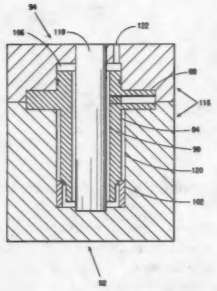
adding an aqueous dispersion comprising a fluorine-containing polymer to a filler-containing polytetrafluoroethylene, followed by exrtrusion molding.

4,985,191

METHOD OF FABRICATING A PINCH VALVE

John L. Hannon, Jr., Amherst, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 458,468, Dec. 28, 1989, Pat. No. 4,960,263.
This application Apr. 26, 1990, Ser. No. 515,039
Int. Cl.[5] B29C 45/14, 35/16
U.S. Cl. 264—135 1 Claim



1. A method of fabricating a pinch valve having an inlet end and an outlet end in a mold comprising the steps of:

providing an elongated tubular housing having an inlet end, a bore, and a cylindrical cut back portion at an outlet end;

applying adhesive to an outer surface of said cut back portion and to an inner surface of the inlet end of the housing;

providing a cylindrical ring having a coefficient of expansion greater than that of the housing;

heating the mold, the ring and the housing to an elevated temperature;

locating the heated housing and heated ring in the mold, the heated ring surrounding and spaced from the outer diameter surface of the cut back portion of the heated housing and closely fitting in a cylindrical chamber in the mold, the chamber having a closed end, so that one end of the heated ring is abutting the closed end of the chamber and the other end is abutting an end of the cut back portion at the outlet end of the heated housing, and the end of the heated housing at the outlet end is spaced from the closed end of the chamber;

placing a core rod inside and spaced from the bore of the heated housing, an end of the rod engaged with the closed end of the chamber;

heating an elastomer and forcing it into the space between the core rod and the heated housing so that it fills the heated housing and flows around the end of the heated housing at the outlet end between the outer diameter surface of the cut back portion of the heated housing and the heated ring;

curing the elastomer to form a sleeve within the heated housing; and

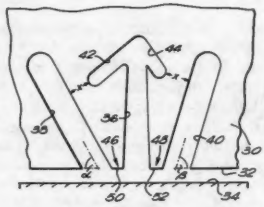
cooling the mold, ring, housing and elastomer and allowing the ring to thermally contract to compressively engage the elastomer between the ring and the housing.

4,985,192

METHODS AND APPARATUS FOR PRODUCING FASTENER PROFILES, AND PRODUCTS INCORPORATING THE SAME

Ronald W. H. Roeder, London, and Geoffrey Brighton, N. Yorks, both of England, assignors to Roeder Industrial Holdings Limited, London, England

Filed Apr. 20, 1989, Ser. No. 342,364
Claims priority, application United Kingdom, Apr. 21, 1988, 8809401
Int. Cl.[5] B29C 47/20
U.S. Cl. 264—177.1 12 Claims



1. An extrusion die for producing a fastener profile having a male profile portion and an alignment rib spaced on each side thereof, the die having a first peripheral slot to produce the male profile portion and second and third peripheral slots spaced from said first slot to produce said alignment ribs, wherein said second and third slots are elongated rectilinear slots with parallel sides and the lengthwise axes of said second and third slots are both inclined relative to the lengthwise axis of said first slot, diverging in the direction away from the die periphery.

10. A method of extruding a fastener profile for a reclosable container or bag, the fastener profile having a male profile portion and an alignment rib spaced on each side thereof, which comprises feeding thermoplastic material through an extrusion die having a first peripheral slot to produce the male profile portion and second and third peripheral slots spaced from said first slot to produce said alignment ribs, wherein said second and third slots are elongated rectilinear slots with parallel sides and the lengthwise axes of said second and third slots are both inclined relative to the lengthwise axis of said first slot, diverging in the direction away from the die periphery.

4,985,193

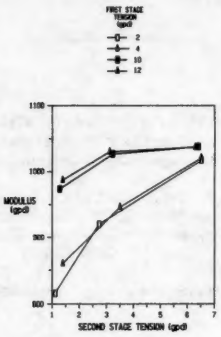
ARAMID YARN PROCESS

Steven R. Allen, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 21, 1989, Ser. No. 312,651
Int. Cl.[5] D01F 6/60
U.S. Cl. 264—184 7 Claims

1. A process for preparing high modulus, high tenacity fibers of aromatic polyamide, comprising the steps of extruding an anisotropic solution of the polyamide in 98.0 to 100.2% sulfuric acid having a polyamide concentration of at least 30 g/100 ml sulfuric acid through a layer of non-coagulating fluid into a coagulating bath to yield fibers, washing the fibers, applying a first constant tension within 40–95% of the fiber breaking load to the washed fibers at a temperature of less than 50° C. for a duration of greater than 5 seconds, and drying the fibers at a

second constant tension which is from 10–100% of the first constant tension and at a temperature of more than the temperature of the first constant tension and less than 350° C. until the fibers have a moisture content of about 2 to 10%.

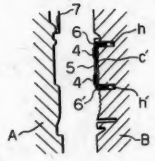


4,985,194

METHOD OF MAKING A DECORATIVE OBJECT HAVING A NOTCH-CUT BACK SIDE

Toshiharu Watanabe, Minokamo, Japan, assignor to Sakae Riken Kogyo Co., Ltd., Japan

Filed Mar. 28, 1988, Ser. No. 174,351
Claims priority, application Japan, Apr. 3, 1987, 62-82604
Int. Cl.[5] B29C *45/14, 45/16;* B32B *27/08*
U.S. Cl. 264—247 **4 Claims**



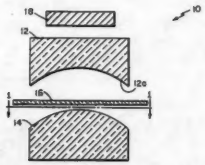
3. A method of manufacturing a light-passing decorative object provided with a notch-cut back side and made of colored semi-transparent non-polycarbonate synthetic resin comprising setting a discrete film of a thickness from about 01 to 1.2 mm, which is fabricated of polycarbonate and is more heat durable than said synthetic resin and on which predetermined patterns are displayed, onto a notch-cut and engraved surface of one die half of a die, closing said one die half with another die half, and injecting the semi-transparent synthetic resin into the die to mold a said decorative object having a notch-cut surface and to closely bond the film to the notch-cut surface of the decorative object so molded, said discrete film being bent to form at least one bent rim and said bent rim of the film being fitted into a groove in the inner surface of said one die half.

4,985,195

METHOD OF FORMING A MOLECULARLY POLARIZED POLMERIC SHEET INTO A NON-PLANAR SHAPE

David T. Wilson, Billerica; Neil T. Dionesotes, Acton, and Paul F. Roman, Dorchester, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 20, 1988, Ser. No. 286,901
Int. Cl.[5] B29C *51/00*
U.S. Cl. 264—320 **13 Claims**



1. A method of forming a sheet of molecularly polarized polymer material into a non-planar shape after said material has been molecularly polarized, comprises the steps of:

disposing said sheet of polymer material about a mold having a selected non-planar shape selected to impart a desired non-planar shape to said sheet; and

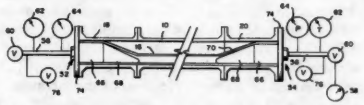
heating said sheet and mold to an elevated temperature above the thermal setting temperature of the material but below the piezoelectric transition temperature of the material for a predetermined period of time.

4,985,196

PIPE LINER PROCESS

Patrick LeDoux, and Lue Fourgaut, both of New Orleans, La., assignors to Pipe Liners, Inc., Metairie, La.

Filed Oct. 30, 1987, Ser. No. 114,949
Int. Cl.[5] B29C *63/38, 53/08*
U.S. Cl. 264—516 **20 Claims**



1. A process for installing in situ a thermoplastic liner in a generally horizontally extending pipe, comprising the steps of:

(a) providing a hollow generally cylindrical liner formed of thermoplastic material having an original outer diameter larger than the inside diameter of the pipe to be lined and a predetermined wall thickness;

(b) altering the cross-sectional shape of the liner to reduce the cross-sectional dimension thereof at a shape memory activation temperature, so as to permit the liner to be pulled into the pipe;

(c) pulling said altered liner into said pipe such that end portions of said liner extend beyond opposite ends of said pipe;

(d) partially expanding the liner end portions which extend beyond the opposite ends other pipe by mechanical means inserted into said liner end portions such that said expanded lining end portions approximate the original cylindrical shape of said liner;

(e) sealing the expanded lining end portions beyond the opposite ends of said pipes to seal the interior of said liner at its opposite ends;

(f) subsequent to the step of sealing the liner and while maintaining the liner sealed, generally conforming said liner to the interior wall of the pipe while maintaining

substantially the original predetermined wall thickness by (1) injecting a heated fluid into and through said sealed liner, (2) pressurizing the interior of said liner to a first predetermined pressure above atmospheric pressure by means of said heated fluid and (3) reheating said liner to a predetermined temperature by heat transfer from said heated fluid to said liner, whereby, the liner returns substantially to its remembered cylindrical shape;

(g) then increasing the pressure in said liner to a second predetermined pressure above said first predetermined pressure to conform the liner substantially precisely to the interior wall surface contours of the pipe; and

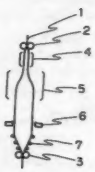
(h) while the liner is still hot, introducing a cooling fluid into the liner for flow therethrough to fix the liner in final form in conformance to the interior wall of the pipe.

4,985,197

PROCESS FOR PREPARING HEAT SHRINKABLE POLYETHYLENE FILM

Hideo Isozaki; Tomoji Mizutani, and Yoshihiro Sakamoto, all of Yatsushiro, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1989, Ser. No. 360,574
Claims priority, application Canada, Sep. 21, 1988, 577989
Int. Cl.[5] B29C *55/28*
U.S. Cl. 264—564 **2 Claims**



1. A process for preparing a heat shrinkable ethylene polymer film, which comprises the steps of:

(1) introducing into a tubular stretching apparatus a non-stretched tubular film of a resin composition comprising as a main component at least one copolymer of ethylene and 0.5 to 10% by mole of an α-olefin having 4 to 12 carbon atoms, said copolymer having a g^* value of 0.3 to 0.7, wherein said g^* value is the ratio of the intrinsic viscosity of the copolymer to the intrinsic viscosity of a linear polyethylene having the same weight average molecular weight as that of said copolymer, and said copolymer having a melt index of 0.3 to 2.0 g/10 min., and a density of 25° C. of 0.86 to 0.92 g/cm^3; and

(2) stretching said non-stretched tubular film to give said heat shrinkable ethylene polymer film by means of a tubular stretching process under the following conditions:

(A) the film surface temperature at the staring point of expansion of the tubular film being within the range of 20° to 30° C. below the ;melting temperature of said resin composition, said melting temperature being the main endothermic peak temperature in a differential scan calorimetry (DSC) curve of said resin composition;

(B) the film in a stretching zone extending from the starting point to the finishing point of expansion having a temperature gradient such that the film surface temperature at a position of ¼ to ¾ the vertical length (L) of the stretching zone from the starting point is maximum, and the difference between the maximum film temperature and the film temperature at the starting point of expansion being not more than 5° C.;

(C) the temperature drop of the film from the maximum temperature position to the finishing point of expansion being within the range of 15° to 20° C.; and

(D) the film being cooled rapidly so that its temperature drops to a value of not more than 60° C. while traveling from the finishing point to a distance of 0.8 time the vertical distance of the stretching zone.

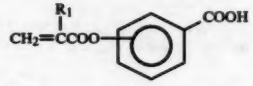
4,985,198

TOOTH-ADHESIVE COMPOUNDS

Tadashi Hirasawa, Tokyo, and Ikuro Harashima, Yokohama, both of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Continuation of Ser. No. 105,282, Oct. 7, 1987, abandoned. This application Mar. 7, 1989, Ser. No. 319,889
Claims priority, application Japan, Apr. 28, 1987, 62-103220
Int. Cl.[5] C07C *69/00*
U.S. Cl. 560—130 **4 Claims**

1. A dental adhesive comprising a compound of the formula:



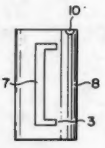
wherein R_1 is a hydrogen atom or a methyl group, and the substituent containing R_1 is located at the o-, m- or p-position with respect to the carboxyl group bonded to the phenyl group.

4,985,199

FUEL SPACER OF SEPARATE CELL TYPE AND MANUFACTURING METHOD THEREFOR

Makoto Irube; Junjiro Nakajima, both of Hitachi; Hajime Umehara, Katsuta; Nobuo Tada, and Masayoshi Ajima, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,111
Claims priority, application Japan, Sep. 28, 1987, 62-243287
Int. Cl.[5] G21C *3/34*
U.S. Cl. 376—442 **9 Claims**



1. A fuel spacer of separate cell type including a number of cylindrical members (separate cell) connected with each other and each provided with two projections for supporting a fuel rod, fuel rod supporting springs each mounted on a contact portion of adjacent two of said cylindrical members and located just opposite to the middle point between said two projections, and striplike side bands surrounding the group of said connected cylindrical members, comprising:

a positioning notch or positioning projection formed on an edge portion of each of said cylindrical members; and

said positioning notch or positioning projection being located opposite to one of said two projections for supporting a fuel rod.

4,985,200

METHOD OF MAKING SINTERED ALUMINIUM NICKEL ALLOYS

Murdo S. MacLean, Glasgow, Scotland, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB88/00879, § 371 Date Jun. 19, 1990, § 102(e) Date Jun. 19, 1990, PCT Pub. No. WO89/03897, PCT Pub. Date May 5, 1989

PCT Filed Oct. 19, 1988, Ser. No. 488,074

Claims priority, application United Kingdom, Oct. 19, 1987, 8724465

Int. Cl.[5] B22F *1/00*

U.S. Cl. 419—19 9 Claims

1. A method of producing a sintered aluminium nickel alloy wherein the ratio of nickel present in 4 to 16% by weight including the step of oxidising nickel surfaces of powder particles, mixing the surface oxidised particles with aluminium powder, and sintering the mixture.

4,985,201

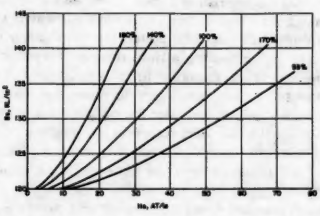
GENERATOR ROTOR STEELS

Keh-Minn Chang, Schenectady, and Ioannis P. Vasatis, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 18, 1989, Ser. No. 451,914

Int. Cl.[5] C22C *38/44, 38/46*

U.S. Cl. 420—109 8 Claims



1. A low-alloy steel suitable for use in generator rotors, consisting essentially of, in weight percent;
about 4.0 to 4.5 percent nickel,
about 1.0 to 1.5 percent chromium,
about 0.3 to 0.8 percent molybdenum,
about 0.05 to 0.15 percent vanadium,
about 0.15 to 0.25 percent carbon,
about 0.03 to 0.1 percent niobium, and
the balance substantially iron, the steel having a high magnetic permeability.

4,985,202

PROCESS FOR FORMING POROUS METAL-SECOND PHASE COMPOSITES

William C. Moshier, Pasadena; John M. Brupbacher; Leontios Christodoulou, Baltimore, and Dennis C. Nagle, Ellicott City, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Continuation of Ser. No. 927,014, Nov. 5, 1986, abandoned, which is a continuation-in-part of Ser. No. 662,928, Oct. 19, 1984, abandoned. This application Aug. 28, 1989, Ser. No. 414,621

Int. Cl.[5] C22C *1/00*

U.S. Cl. 420—590 67 Claims

1. A method for the production of porous metal-second phase composite material, the method comprising precipitating at least one second phase material in a solvent metal by locally igniting a mixture comprising reactive second phase forming constituents and at least about 20 volume percent of a substantially nonreactive solvent metal in which the second phase-forming constituents are move soluble than the second phase material, substantially at or below atmospheric pressure and at a temperature at which sufficient diffusion of the reactive second phase forming constituents into the substantially nonreactive solvent metal occurs to cause a substantially isothermal second phase forming reaction of the constituents to thereby precipitant second phase particles in the solvent metal so as to produce a solid composite material having a porosity of at least 10 percent comprising finely divided second phase particles in the metal matrix.

4,985,203

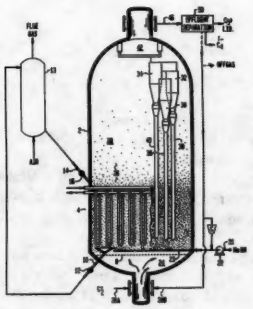
CONVERSION SYSTEM FOR CONVERTING OXYGENATES TO HYDROCARBONS

Samuel A. Tabak, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 779,346, Sep. 23, 1985, Pat. No. 4,654,453. This application Feb. 5, 1987, Ser. No. 11,666

Int. Cl.[5] B01J *8/24;* C10G *11/18*

U.S. Cl. 422—190 5 Claims



1. A process reactor system for converting oxygenate feedstock to liquid hydrocarbons comprising:
first reactor means for converting oxygenate feedstock predominantly to gasoline range hydrocarbons in a first reactor zone, in contact with acid shape selective, medium pore zeolite catalyst thereby producing a minor amount of excess isobutane;
means for separating isobutane from the first reactor effluent;
second reactor means for converting oxygenate feedstock predominantly to C_2–C_5 lower olefins in a second reactor zone in contact with zeolite catalyst, while maintaining sufficient production of C_3+olefins in the second reactor zone to react with excess isobutane produced in the first reactor zone;
means for separating an ethene rich stream from the second reactor olefinic effluent;
means for passing the ethene-rich stream to the first reactor zone for further conversion of ethene to heavier hydrocarbons; and
alkylation reactor means for alkylating the isobutane with C_3+ olefins in a third reactor zone in contact with an acid catalyst.

4,985,204

DEVICE FOR CARRYING OUT A HETEROGENEOUS REACTION

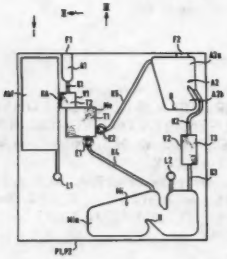
Sigmar Klose, Berg; Klaus Erler, Pöcking; Wolfgang Uhl, Weilheim, and Manfred Baier, Seeshaupt, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Feb. 23, 1988, Ser. No. 159,253

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1987, 3706718

Int. Cl.[5] G01N 31/22, 21/03

U.S. Cl. 422—56 49 Claims



1. Device for determining a component of a sample liquid, said device comprising:

a measurement chamber containing a first capillary action carrier and a first reagent, which is non-soluble in said sample liquid, adhering to said first capillary action carrier,

a first pre-chamber containing a second capillary action carrier and a second reagent, which is soluble in said sample liquid, adhering to said second carrier, said second carrier being in bodily capillary contact with said first carrier, said first pre-chamber lying above said measurement chamber in a first working position of said device,

a first application chamber having a first filling opening for introduction of said sample liquid and which, in said first working position of said device, lies above said first pre-chamber,

a first capillary means connecting said first application chamber to said first pre-chamber,

a waste chamber which lies below said measurement chamber in a second working position of said device,

gravitational capillary means between said measurement chamber and said waste chamber and permitting flow of liquid from said measurement chamber to said waste chamber only under a predetermined gravitational force, and

a second application chamber having a second filling opening for introduction of liquid, said second application chamber being connected via a second capillary means with a second pre-chamber, said second pre-chamber containing at least one indicator reagent on a third capillary action carrier, said second pre-chamber being connected via a third capillary means with a mixing chamber, said mixing chamber being connected via a fourth capillary means with said measurement chamber.

4,985,205

TEST CARRIER ANALYSIS SYSTEM

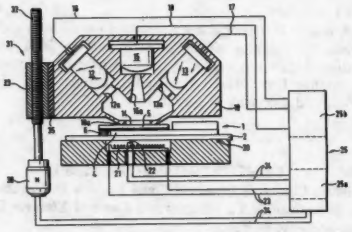
Rainer Fritsche, Bruhl; Klaus Nöhl, Heddesbeim, both of Fed. Rep. of Germany; Klaus Pollmann, Indianapolis, Ind., and Elmar Schmidt, Bruhl, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Dec. 27, 1989, Ser. No. 456,144

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1988, 3844104

Int. Cl.[5] G01N 21/27, 31/22

U.S. Cl. 422—56 17 Claims



1. Test carrier analysis system for the analytical determination of a component of a fluid sample comprising:

test carriers comprising a base layer and test layers fixed thereto, said test layers containing a reagent system for reacting with said component to produce a detectable change and including a fluid reservoir layer and a color formation layer, the color formation layer being movably connected to the base layer to move between an initial position wherein the color formation layer is out of fluid contact with the fluid reservoir layer and a second position wherein the color formation layer is pressed against the fluid reservoir layer in fluid-exchange contact therewith,

and an evaluation apparatus comprising pressure means for pressing the color formation layer against the fluid reservoir layer in fluid-exchanging contact therewith, and optical means for the reflometric determination of the color variation of the color formation layer by (a) a reference measurement wherein the diffuse reflection of the color formation layer is determined, and (b) a sample measurement in which the diffuse reflection of the color formation layer is determined, with the reference measurement and the sample measurement being conducted in turn on the color formation layer by the said optical means after the color formation layer is pressed against the fluid reservoir layer by the pressure means.

9. Method for the analytical determination of a fluid sample using a test carrier having a base layer and test layers fixed thereto, with the test layers including a color formation layer and a fluid reservoir layer, and also using an evaluation apparatus which includes a pressure element by which the color formation layer may be pressed against the fluid reservoir layer, an optical unit to reflectometrically determine the color variation of the color formation layer, and a control unit for controlling the apparatus functions,

said method comprising placing a fluid sample to be determined on the fluid reservoir layer while the color formation layer is out of fluid-exchange contact therewith, thereafter pressing the color formation layer into fluid-exchange contact with the fluid reservoir layer by the pressure element to cause color formation, and thereafter controlling the optical unit by the control unit to cause the same optical unit to in turn make a reference measurement and a sample measurement on the color formation layer, with the reference measurement including the determina-

tion of the diffuse reflectivity of the color formation layer directly after the layers are placed in fluid-exchange contact.

4,985,206

TISSUE PROCESSING APPARATUS

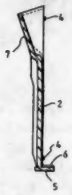
David J. Bowman, Manchester; Raymond F. Cosgrove, Wallasey; Terence P. Male, Helsby, and Robert Evans, Liverpool, all of England, assignors to Shandon Scientific Limited, Runcorn, England

Filed Sep. 29, 1988, Ser. No. 250,929

Claims priority, application United Kingdom, Sep. 30, 1987, 8722902

Int. Cl.[5] B01L *11/00*; B05C *21/00*; G01N *21/00*

U.S. Cl. 422—99 4 Claims



1. Apparatus for applying liquids to material on a flat face of a carrier, comprising

a member including a web having a flat face, flanges projecting from each side of the face of the web to form a channel therebetween, and a cross piece connecting the flanges at one end of the channel, and

means for locating the carrier on the flanges to form a clearance between the flat face of the web and the face of the carrier which is of capillary dimensions,

said clearance having an outlet between the lower edge of the carrier and the cross piece and an inlet between the upper edge of the carrier and the face of the web whereby liquid introduced through the inlet and into the clearance will be retained by surface tension until displaced by additional liquid supplied to the inlet.

4,985,207

BIOCHEMICAL REACTION ANALYZING APPARATUS

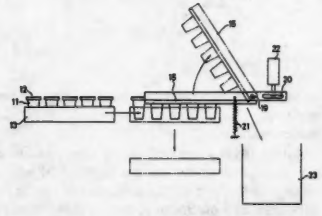
Hidechika Hayashi, Yokohama, Japan, assignor to Tosoh Corporation, Shinnanyo, Japan

Continuation of Ser. No. 150,655, Jan. 11, 1988, abandoned. This application Mar. 30, 1990, Ser. No. 503,109

Claims priority, application Japan, Jun. 10, 1986, 61-134447

Int. Cl.[5] G01N *35/04*

U.S. Cl. 422—102 8 Claims



1. A biochemical reaction measuring apparatus which performs biochemical reaction measuring processes, including a carrying plate carrying thereon at least one array of cups providing biochemical reaction cells, means for conveying said carrying plate substantially horizontally in the direction of the cup array, and a cup unloading mechanism at a position where the substantially horizontal transportation of said carrying plate terminates, said cup unloading mechanism comprising:

means for forming open ended channels, each of said channels having two open ends and into which top parts of said cups on said carrying plate are fitted at said position where transportation terminates, and

cup hanging means comprising bar members placed at both sides of said channels and having side edge parts to engage with and hang said arrays of cups fitted in said channels,

whereby cups can be both moved into and out of said channels by movement in the same direction.

4,985,208

POLYMERIZATION REACTION APPARATUS

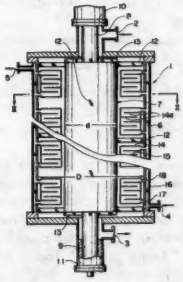
Hitoshi Sugawara, Kisarazu; Minoru Goto, Kitakyushu; Yoshitaka Sakamaki, Kimitsu, and Toshio Fujita, Kitakyushu, all of Japan, assignors to Nippon Steel Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 172,899

Claims priority, application Japan, Mar. 27, 1987, 62-71378

Int. Cl.[5] B01F *15/06*

U.S. Cl. 422—135 4 Claims

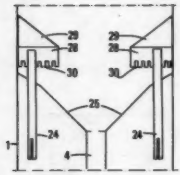


1. A polymerization reaction apparatus which comprises a vertical cylindrical vessel having at opposite ends an inlet and an outlet for a reacting mass, a vertical rotating shaft inside said vessel, a plurality of horizontally agitating, blades attached to said rotating shaft at prescribed intervals along the axis of said rotating shaft and being adapted to agitate a reacting mass in the same horizontal plane without substantial backmixing, and a plurality of heat transfer plates, said plates being internally provided with a passage for a heat transfer fluid entering from the outer wall of said vessel, said plates protruding at predetermined intervals from around the inner wall of said vessel into the space between said agitating blades, and which are disposed radially around the rotating shaft thereby forming a plurality of vertical channels between said plates, and in which apparatus a reacting mass fed from the inlet of said vessel passes through said channels without substantial backmixing between said plurality of heat transfer plates.

4,985,209
APPARATUS FOR INJECTING A HYDROCARBON CHARGE INTO A REACTOR

Pierre Renard, Saint Nom la Breteche; Jean-Claude Simandoux, Sainte Foy les Lyon, and Jean-Pierre Burzynski, Lyon, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 29, 1988, Ser. No. 277,594
Claims priority, application France, Nov. 30, 1987, 87 16692; Jun. 23, 1988, 88 08576
Int. Cl.[5] B01J 8/18
U.S. Cl. 422—140 10 Claims



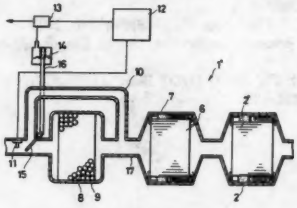
1. An apparatus comprising:
(a) a substantially vertical reactor vessel of elongate and cylindrical shape;
(b) means for introducing solid particles into an upper part of said reactor vessel;
(c) means for withdrawing solid particles from a bottom part of said reactor vessel, said means for withdrawing essentially consisting of at least one substantially vertical pipe extending to the exterior of said reactor vessel;
(d) at least one funnel defining a flared zone for supporting solid particles, said flared zone having an apex which is turned downward, said funnel being arranged in a lower portion of said reactor vessel and said funnel being perforated for the passage of said at least one substantially vertical pipe and of at least two other substantially vertical conduits;
(e) means for introducing a fluid charge, formed of a liquid and a gas, into a lower section of said reactor vessel below said funnel;
(f) means for withdrawing reaction effluents from an upper part of said reactor vessel; and
(g) at least two fluid charge injection devices, each device comprising:
at least a respective one of said at least two substantially vertical conduits passing through said funnel, a lower open end of said respective substantially vertical conduit being located below said funnel and above said means for introducing a fluid charge, and an upper open end thereof being located above said funnel and relatively close thereto, and
a cap covering said upper end of said substantially vertical conduit, a lower part of said cap defining a perimeter comprising several indentations arranged on a major part of said perimeter.

4,985,210
EXHAUST GAS PURIFYING APPARATUS FOR AUTOMOBILE

Takashi Minami, Toyota, Japan, assignor to 501 Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 30, 1989, Ser. No. 400,797
Claims priority, application Japan, Sep. 9, 1988, 63-226070
Int. Cl.[5] B01D 50/00
U.S. Cl. 422—169 3 Claims

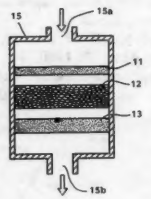
1. An exhaust purifying apparatus designed to purify exhaust gas by means of catalyst, comprising:
a catalytic converter accommodating the catalyst;
an adsorbent trapper connected to the upstream side of said catalytic converter, said trapper accommodating either a Y-type zeolite or a mordenite adsorbent for adsorbing a harmful component in exhaust gas;
an activated carbon trapper accommodating activated carbon and connected to the upstream side of said adsorbent trapper;
a by-pass provided between a first upstream exhaust pipe connected to the upstream side of said activated carbon trapper and a second exhaust pipe connecting the downstream side of said activated carbon trapper and the upstream side of said adsorbent trapper; and
a switching valve provided at the intersection of said by-pass with said first upstream exhaust pipe, said switching valve being opened and closed in response to the operation of a solenoid-operated valve which is opened and closed in response to a signal from an exhaust gas temperature sensor when the temperature of said exhaust gas is within the range of from 100° C. to 300° C.



4,985,211
EXHAUST GAS PROCESSING APPARATUS FOR PAINT DRYING OVEN

Shunichi Akiyama; Norio Sato, both of Toyota; Kenichirou Suzuki, Aichi; Taisuke Yoshimoto, Nagoya, and Hideaki Nakasho, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota; Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi and Trinity Industrial Corporation, Tokyo, all of, Japan

Filed Oct. 26, 1988, Ser. No. 262,964
Claims priority, application Japan, Oct. 26, 1987, 62-163416[U]
Int. Cl.[5] B01D 53/36
U.S. Cl. 422—171 1 Claim



1. An exhaust gas processing apparatus for a paint drying oven comprising:
a reaction container;
a first catalyst layer disposed at an upstream side of said reaction container comprising a support of a honeycomb substance or a foamed substance, a carrier layer formed on said support and a platinum group element catalyst loaded on said carrier layer;
a second catalyst layer disposed downstream of said first catalyst layer comprising a support of a pellet substance, a honeycomb substance, or a foamed substance and a platinum group element catalyst; and

a third catalyst layer disposed downstream of said second catalyst layer comprising a support, a carrier layer formed on said support, and a copper-cerium-silver catalyst containing 4 wt. % copper, 0.4 wt. % cerium, and 1.5 wt. % silver based on the weight of said carrier, loaded on said catalyst layer;

whereby harmful components contained in exhaust gases are oxidized and decomposed.

4,985,212

SUPPORT APPARATUS FOR A CERAMIC HONEYCOMB ELEMENT

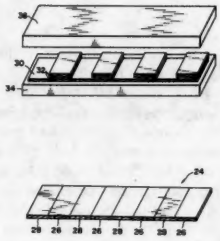
Takashi Kawakami, Yokohama, and Yasuhiro Kashima, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 250,243, Sep. 28, 1988, abandoned. This application Jan. 24, 1990, Ser. No. 470,434

Claims priority, application Japan, Sep. 29, 1987, 62-245428; Mar. 28, 1988, 63-73810

Int. Cl.[5] B01D *53/36*

U.S. Cl. 422—179 **3 Claims**



1. A reactor comprising:

a hollow cylindrical ceramic honeycomb element containing a catalyst, having a number of rectangular holes defined by a pair of parallel wall groups intersecting each other perpendicularly and extending in the axis of the ceramic element;

a casing made of material having a higher thermal expansion coefficient than said ceramic element, and having a circular cross section, and surrounding said ceramic element, thus defining an annular space between the outer periphery of said ceramic element and the inner periphery of the casing; and

a ring-shaped filling member filled in the annular space so as to seal the annular space, having a uniform thickness and made of a material the thermal-expansion coefficient and elasticity of which increase in proportion to the density of the material, said filling member including,

at least two high-density portions located at each of two regions which are diametrically opposed with respect to the axis of the ceramic element and at which at least one of the wall groups of said ceramic element extend substantially normal to the filling member, and

at least two low-density portions located at each of two regions other than the regions at which the high-density portions are located;

whereby said high-density portions have a density higher than that of said low-density portions such that when said ceramic element is heated, the high-density portions expand more than the low-density portions and apply greater force to said ceramic element, such that the high-density portions firmly hold said ceramic element and seal the annular space, while the low-density portions seal the annular space in a manner that the low-density portions apply substantially less force to said ceramic element than the high-density portions.

4,985,213

EXHAUST GAS TREATING APPARATUS

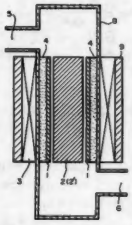
Takashi Ooe, Yokohama; Shinji Ogawa, Takaishi; Akiko Miura, Yokohama, and Ryohei Itatani, Kyoto, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed May 23, 1989, Ser. No. 355,660

Claims priority, application Japan, May 26, 1988, 63-126914

Int. Cl.[5] B01J *19/08, 19/12*

U.S. Cl. 422—186.01 **14 Claims**



1. An exhaust gas treating apparatus comprising a discharge tube which includes a tubular chamber having a gas introduction opening and a gas withdrawal opening and at least one pair of cathodes and at least one pair of anodes provided in the tubular chamber so as to form a gas flow passage, and a power supply selected from the group consisting of a dc power supply and an ac power supply connected to the electrodes; wherein

the pair of cathodes is positioned opposite to each other and approximately parallel to the gas flow passage,

a space formed by the pair of cathodes is in communication at one end with the gas introduction opening and at the other end with the gas withdrawal opening,

the pair of anodes is positioned in said space opposite to each other in a direction nearly at right angles to the cathodes and without contact with the cathodes, and

a magnetic field applying means is secured to the discharge tube for generating a magnetic field selected from the group consisting of a dc magnetic field and an ac magnetic field in the opposing direction of the cathodes.

4,985,214

SIMULTANEOUS PRODUCTING OF HIGHER CHLOROMETHANES

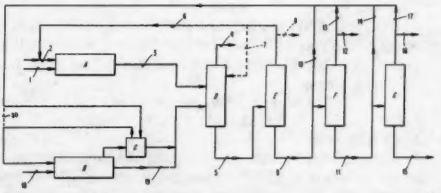
Jean-Jacques Masini, Chaponost, and Yvan Verot, Ecully, both of France, assignors to Atochem, Puteaux, France

Division of Ser. No. 99,783, Sep. 22, 1987, Pat. No. 4,765,876, which is a continuation of Ser. No. 773,927, Sep. 9, 1985, abandoned, which is a continuation of Ser. No. 619,357, Jun. 11, 1984, abandoned. This application May 3, 1988, Ser. No. 189,832

Claims priority, application France, Jun. 10, 1983, 83 09667

Int. Cl.[5] B01J *19/00*

U.S. Cl. 422—188 **23 Claims**



1. Apparatus for the simultaneous preparation of the higher

chloromethanes CH_2Cl_2, $CHCl_3$ and CCl_4, comprising parallel first and second chlorination reaction means A and B, means for reaction product combination and separation in downstream, discrete communicating relationship with each of said reaction means A and B, means for separating higher chloromethanes from combined reaction product, and means for recycling at least one separated higher chloromethane directly from said separating means to said second reaction means B.

4,985,215

Patent Not Issued For This Number

4,985,216

REDUCTION ROASTING OF METAL ORES

Mamdouh M. El Tawil, Belle Mead, and Adrian E. Albrethsen, Bridgewater, both of N.J., assignors to ASARCO Incorporated, New York, N.Y.

Continuation of Ser. No. 701,715, Feb. 14, 1985, abandoned. This application Jul. 20, 1988, Ser. No. 222,336

Int. Cl.[5] C01G *5/00, 45/02;* **C22B** *3/12, 11/08*

U.S. Cl. 423—29 **4 Claims**

1. A substantially natural gas free reduction roasting method for recovering silver from a manganese oxide-silver ore containing, in weight percent, about 40% to 90% SiO_2, 0.4% to 30% manganese, and up to about 4% zinc, 3% lead, 0.3% copper and 75 ounces/ton silver comprising:

(a) reacting the ore at a temperature about 300° to 800° C. for a sufficient time with a hydrocarbon which is predominately ethane, propane or butane to reduction roast the ore;

(b) cooling the reacted ore under a nonoxidizing atmosphere; and

(c) leaching the silver from the reacted ore with a cyanide leachant.

4,985,217

METHOD FOR REMOVING NITROGEN OXIDES FROM GASES

Peter J. Schmid, Neustiftgasse 93, A-1070 Vienna, Austria

Filed Apr. 5, 1990, Ser. No. 505,039

Claims priority, application Austria, Oct. 25, 1989, A2471/89; Feb. 1, 1990, A207/90

Int. Cl.[5] C01B *21/00, 21/22, 21/24*

U.S. Cl. 423—235 **1 Claim**

1. A method for removing nitrogen oxides selected from the group consisting of NO and NO_2 from a gas containing said oxides, which comprises the steps of

(a) injecting NO_2 into the gas until a molar ratio of 1 between NO and NO_2 is obtained;

(b) absorbing the thus obtained nitrogen oxides in a hydrous ammonia solution at a temperature of about 20° C. to 30° C. to obtain ammonium nitrite;

(c) oxidizing the thus obtained ammonium nitrite to obtain ammonium nitrate;

(d) reacting a part of the thus obtained ammonium nitrate with a strong acid selected from the group consisting of hydrochloric acid and sulfuric acid to produce NO_2; and

(e) recirculating the thus produced NO_2 to step (a) to obtain the molar ratio of 1.

4,985,218

PROCESS AND INJECTOR FOR REDUCING THE CONCENTRATION OF POLLUTANTS IN AN EFFLUENT

Vincent A. DeVita, Stamford, Conn., assignor to Fuel Tech, Inc., Stamford, Conn.

Filed Mar. 3, 1989, Ser. No. 319,173

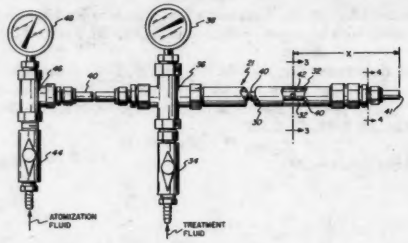
Int. Cl.[5] B01D *53/34*

U.S. Cl. 423—235 **16 Claims**

1. A multistage process for reducing the concentration of nitrogen oxides in an effluent passage containing effluent from the combustion of carbonaceous material in a boiler, using in a second stage an injector including an atomization conduit and a supply conduit, said atomization conduit having an inner diameter and an injector nozzle at one end positioned in said effluent passage, said supply conduit being operably connected with said atomization conduit by at least one jet penetrating the wall of said atomization conduit upstream of said nozzle; the process comprising:

(a) in a first stage, injecting a first treatment fluid comprising urea, ammonia or a nitrogenated hydrocarbon or mixtures thereof into the effluent at a first temperature zone when the effluent is at a temperature of about 1350° F. to about 2200° F.; and

(b) in a second stage, injecting a second treatment fluid



comprising a hydrocarbon into the effluent at a second temperature zone when the effluent is at a temperature of about 800° F. to about 1400° F., wherein said step of injecting a second treatment fluid comprises

supplying said second treatment fluid in an amount effective to reduce pollutants in said effluent through said supply conduit and through said at least one jet into said atomization conduit at a velocity of between about two to about sixty feet per second at a distance upstream of said nozzle of up to about thirty-two times the inner diameter of said atomization conduit;

simultaneously supplying an atomization fluid through said atomization conduit to contact said second treatment fluid and inject said second treatment fluid into said effluent passage.

4,985,219

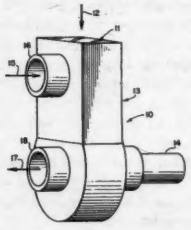
REMOVAL OF NITROGEN OXIDES FROM WASTE GASES

Dennis J. Helfritch, Flemington, and Philip C. Efthimion, Bedminster, both of N.J., assignors to Research-Cottrell, Inc., Somerville, N.J.

Filed Feb. 14, 1990, Ser. No. 480,083

Int. Cl.[5] C01B *21/00*

U.S. Cl. 423—235 **9 Claims**



1. A method for the removal of nitrogen oxides from a waste gas containing nitrogen oxides comprising contacting said waste gas with the products of the pyrolytic decomposition of methane, said pyrolytic decomposition products consisting essentially of CH and CH_2 radicals and said contact between said waste gas and said pyrolytic decomposition products being effected at a temperature of from about 100° C. to about

1,000° C. and for a time sufficient for said CH and CH_2 radicals to substantially reduce said nitrogen oxides to nitrogen.

4,985,220

HYDROGEN FLUORIDE VAPOR CONTAINMENT

Costandi A. Audeh, Princeton, and Saverio G. Greco, Princeton Junction, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 8, 1988, Ser. No. 229,668
Int. Cl.[5] C01B *7/00*
U.S. Cl. 423—240 16 Claims

1. A method for the containment of a vaporous cloud containing hydrofluoric acid which comprises the steps of;

(a) drenching the cloud with a water drench;

(b) drenching the cloud with an aqueous solution containing at least one compound of the formula of $CaCl_2$ and $CaBr_2$; and

(c) drenching the cloud with a composition comprising at least one foam generating surfactant, a foam stabilizer for stabilizing the generated foam, and a phase transfer agent.

4,985,221

PHLEGMATIZED RED PHOSPHORUS

Horst Staendeke, Lohmar, and Ursus Thëmmler, Erftstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 2, 1990, Ser. No. 474,475
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1989, 3905039
Int. Cl.[5] C01B *25/023*
U.S. Cl. 423—265 11 Claims

1. Phlegmatized, pulverulent red phosphorus with good free-flowing properties, consisting essentially of 95 to 99.95% by weight of red phosphorus having a particle size of up to 2 mm, and 0.05 to 5% by weight of polyurethane as phlegmatization agent.

5. A process for the preparation of phlegmatized, pulverulent red phosphorus with good free-flowing properties as claimed in claim 1, which comprises introducing an aqueous polyurethane dispersion into an aqueous suspension of red phosphorus having a particle size of up to 2 mm, after a pH of from 5 to 9 has been set, in a manner such that 5 to 0.05 parts by weight of polyurethane are present per 95 to 99.95 parts by weight of red phosphorus, then stirring the mixture at a temperature of from 20° to 90° C. for 0.5 to 3 hours, and finally drying the phlegmatized red phosphorus at elevated temperature after filtration.

4,985,222

PROCESS FOR PREPARATION OF ALUMINUM BORATE WHISKER

Hajime Hata, and Hajime Kanbara, both of Marugame, Japan, assignors to Shikoku Chemicals Corporation, Kagawa, Japan

Filed Nov. 17, 1989, Ser. No. 437,630
Int. Cl.[5] C01B *35/12*
U.S. Cl. 423—279 5 Claims

1. A process for the preparation of an aluminum borate whisker, which consists essentially of mixing as an aluminum source component, trisodium or tripotassium aluminum trisulfate or mixtures thereof represented by the following general formula:

$$M_3Al(SO_4)_3$$

wherein M represents an alkali metal selected from the group consisting of sodium, potassium, with at least one boric anhydride source component selected from the group consisting of boron oxides, boron oxyacids and alkali metal salts thereof, and reacting the mixture of a temperature of from 700° to 1200° C. to effect growing of said aluminum borate whisker.

4,985,223

CRYSTALLINE ALUMINOSILICATE

Pochen Chu, West Deptford; Joseph A. Herbst, Turnersville; Donald J. Klocke, Somerdale, all of N.J., and James Vartuli, West Chester, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 17, 1984, Ser. No. 651,149
Int. Cl.[5] C01B *33/28*
U.S. Cl. 423—328 13 Claims

1. A synthetic porous crystalline aluminosilicate zeolite having a silica to alumina molar ratio of from about 5 to about 500, said porous crystalline material in the uncalcined state being characterized by an x-ray diffraction pattern having values substantially as set forth in Table 1 of the specification.

4,985,224

PROCESS FOR MAKING SILICON NITRIDE WHISKER

Isao Imai, Nagoya; Toshitsugu Ishii, Chita, and Kouichi Sueyoshi, Kariya, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Japan

Filed Oct. 11, 1989, Ser. No. 420,033
Int. Cl.[5] C01B *21/068*
U.S. Cl. 423—344 20 Claims

1. A process for producing silicon nitride whiskers, said process comprising:

providing a powder consisting essentially of silica;

contacting said powder with a gas mixture consisting essentially of ammonia and hydrocarbon gas, the NH_3/CH_4 ratio of said ammonia to said hydrocarbon, expressed as CH_4, ranging from 0.5:1 to 2000:1 by volume; and

heating said powder in said gas mixture to a temperature of 800° C. to 1700° C. while said gas mixture is supplied at the rate of 10 mm/sec or less;

wherein the silicon nitride whiskers are produced according to the following reaction:

$$3SiO_2+4NH_3=Si_3N_4+6H_2O$$

and the H_2O generated during the reaction is removed from said gas mixture in accordance with the following reaction:

$$mH_2O+CmHn=mCO+(m+n/2)H_2.$$

4,985,225

PROCESS FOR PRODUCING ALUMINUM NITRIDE POWDERS

Noboru Hashimoto; Yasushi Sawada; Hiroyoshi Yoden, all of Osaka; Shigehito Deki, Hyogo, and Hisamitsu Takahashi, Osaka, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 22, 1988, Ser. No. 273,761
Claims priority, application Japan, Oct. 26, 1987, 62-271050; Nov. 28, 1987, 62-301301; Mar. 19, 1988, 63-66154
Int. Cl.[5] C01B *21/072*
U.S. Cl. 423—412 12 Claims

1. A process for producing aluminum nitride powders, comprising mixing an aluminum polynuclear complex and (1) a water-soluble carbon-containing compound and/or a water-soluble nitrogen-containing and carbon-containing compound or (2) a water-soluble carbon-containing compound and a water-soluble nitrogen-containing compound, with water; drying the mixture to obtain a solid; and calcining said solid in a nitrogen-containing non-oxidative atmosphere.

11. A process for producing aluminum nitride powders, comprising mixing an aluminum alkoxide which has been rendered water-soluble and (1) a water-soluble carbon-containing compound and/or a water-soluble nitrogen-containing and carbon-containing compound or (2) a water-soluble carbon-containing compound and a water-soluble nitrogen-containing compound, with water; drying the mixture to obtain a solid; and calcining said solid in a nitrogen-containing non-oxidative atmosphere.

4,985,226

HOLE-BURNING MATERIAL AND PRODUCTION THEREOF

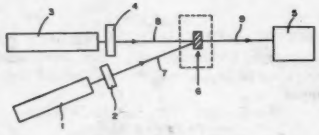
Shuichi Satoh; Kazuwo Tsuji; Takeru Nakashima; Shuji Yazu, all of Itami; Yosio Nisida, Takatsuki; Kiyofumi Muro, Ichihara; Yuzo Demizu, Kamifukuoka; Masuo Nakagawa, Takamatsu, and Moritami Okada, Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 15, 1989, Ser. No. 366,655

Claims priority, application Japan, Jun. 20, 1988, 63-153044; Jul. 8, 1988, 63-171635; Sep. 26, 1988, 63-241279; Jan. 7, 1989, 1-1461

Int. Cl.[5] C01B *31/06*

U.S. Cl. 423—446 9 Claims



1. A hole-burning diamond material which comprises at least one hole which is formed on a zero-phonon line and semi-permanently lasts without suffering from any change in the temperature range from 20 to 120 K. and which can be erased by irradiation of excited light having an energy larger than the zero-phonon line.

4,985,227

METHOD FOR SYNTHESIS OR DIAMOND

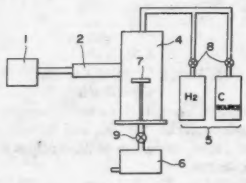
Toshimichi Ito; Masaaki Nosaka, and Ikuo Hosoya, all of Chiba, Japan, assignors to Indemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,561

Claims priority, application Japan, Apr. 22, 1987, 62-99118; May 2, 1987, 62-109193; Nov. 28, 1987, 62-301035

Int. Cl.[5] C01B *31/65*

U.S. Cl. 423—446 6 Claims



1. A method for synthesis of diamond which comprises contacting a substrate with a gas consisting essentially of a mixture of excited carbon monoxide gas and excited hydrogen gas at a ratio of carbon monoxide of 1–80 mol % per total of carbon monoxide and hydrogen.

4,985,228

PURIFICATION OF HYDROGEN PEROXIDE

Kirby Kirksey, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 17, 1990, Ser. No. 553,291

Int. Cl.[5] C01B *15/01*

U.S. Cl. 423—584 12 Claims

1. A process for the purification of hydrogen peroxide which includes the removal of impurities, comprising the steps of:

(a) pretreating activated carbon by at least one hot washing of the same with ammonium carbonate;

(b) contacting a quantity of hydrogen peroxide to be purified with the resultant washed activated carbon thereby effecting the absorbing of impurities present in the hydrogen peroxide; and

(c) separating the contacted hydrogen peroxide and distilling the same.

7. A process for the purification of hydrogen peroxide which includes the removal of impurities, comprising the steps of:

(a) pretreating activated carbon by at least one hot washing of the same with ethylenediaminetetraacetic acid diammonium salt;

(b) contacting a quantity of hydrogen peroxide to be purified with the resultant washed carbon thereby effecting the absorbing of impurities in the hydrogen peroxide; and

(c) separating the contacted hydrogen peroxide and distilling the same.

4,985,229

PROCESS FOR MANUFACTURING FINE ZIRCONIUM OXIDE POWDER

Masamichi Obitsu, Funabashi; Isao Tomi, Chiba, and Takao Kaga, Funabashi, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 100,723

Claims priority, application Japan, Sep. 27, 1986, 61-229102

Int. Cl.[5] C01G *25/02*

U.S. Cl. 423—608 9 Claims

1. A process for manufacturing fine zirconia oxide powder, which comprises:

preparing a zirconia sol, wherein the zirconia sol is obtained by hydrolyzing with heat an aqueous solution containing a member selected from the group consisting of zirconium salt, zirconium hydroxide and zirconia hydrate and then filtering the thus hydrolyzed aqueous solution by way of an ultra-filtration membrane,

adding a metal hydroxide of at least one metal selected from the group consisting of calcium, magnesium, yttrium and lanthanide series elements to the zirconia sol,

dehydrating or drying the zirconia sol containing said metal hydroxide, and

calcining the dehydrated or dried zirconia sol to obtain fine zirconium oxide powder, wherein the zirconia sol is a sol of zirconia having a particle size of from 500 to 5000 A.

4,985,230

METHOD OF CARRYING OUT HETEROGENEOUS CATALYTIC CHEMICAL PROCESSES

Niels T. Baden, Virum; Ernst J. Jensen, Frederikssund, and Jorgen G. Larsen, Soborg, all of Denmark, assignors to Haldor Topsoe A/S, Denmark

Filed Aug. 26, 1988, Ser. No. 236,897

Claims priority, application Denmark, Aug. 27, 1987, 4481/87

Int. Cl.[5] C01B *3/24, 3/26;* C07C *27/06*

U.S. Cl. 423—650 14 Claims

1. In a method of carrying out a heterogeneous catalytic chemical process at non-adiabatic conditions by passing a stream of a process fluid in one overall flow direction through a catalyst contained in a catalyst chamber defined by walls two of which are substantially uniformly spaced, and transmitting heat through at least one of the two substantially uniformly spaced walls between the process fluid inside the catalyst chamber and a fluid outside the catalyst chamber, said catalyst

having a structure of channels arranged in groups of substantially parallel channels causing the process fluid to be subdivided into a plurality of sub-streams having actual flow directions angled to the two uniformly spaced walls and the overall flow direction, and changing direction whenever reaching one of the walls, the improvement which comprises that the mass flow towards one of the two substantially uniformly spaced walls, at any cross section orthogonal to the overall flow direction, is approximately equal to the mass flow towards the other of said two walls, the flow direction of the sub-streams in one group of channels being different from that in the neighboring group or groups of channels, and that the actual flow direction of any sub-stream is changed whenever it reaches one of the two substantially uniformly spaced walls in leaving a channel and entering neighboring channels, so as to direct the sub-stream towards the other of said substantially uniformly spaced walls.

4,985,231

PRODUCTION OF HYDROGEN-CONTAINING GAS STREAMS

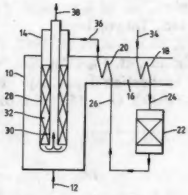
Warwick J. Lywood, Hutton Rudby, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Dec. 7, 1988, Ser. No. 280,964

Claims priority, application United Kingdom, Dec. 10, 1987, 8728882

Int. Cl.[5] C01B *3/26*

U.S. Cl. 423—652 **5 Claims**



1. A process for the production of a hydrogencontaining gas stream comprising:

(a) forming a gaseous feed mixture of a desulphurised natural gas and a reforming gas selected from steam, carbon dioxide, and mixtures of steam and carbon dioxide;

(b) preheating said feed mixture;

(c) partially reforming the preheated feed mixture in at least one adiabatic bed of steam reforming catalyst, thereby forming a partially reformed gas;

(d) reheating said partially reformed gas after passage through said at least one adiabatic bed;

(e) feeding said re-heated partially reformed gas to a double tube reformer having outer tubes each of which has a closed end and an inner tube associated with each outer tube thereby defining an annular region containing a steam reforming catalyst between each outer tube and its associated inner tube, said reformer being free of insulation between said inner tubes and said steam reforming catalyst in said annular region, said re-heated partially reformed gas being fed to outer tubes at ends thereof remote from said closed ends;

(f) passing said re-heated partially reformed gas over said catalyst in said annular regions, while heating the exterior of said outer tubes in a fired furnace, thereby forming a reformed gas;

(g) withdrawing said reformed gas from a region adjacent the closed end of each of said outer tubes through said inner tube associated with that outer tube, whereby heat exchange takes place between said reformed gas passing through said inner tubes and said re-heated partially reformed gas undergoing the steam reforming reaction in said annular regions, thus supplying some of the heat required for the endothermic steam reforming reaction; and

(h) supplying the heat:

(i) for the preheating step (b) and for any reheating of partially reformed gas after said partially reformed gas has passed through a first adiabatic bed and before said partially reformed gas has passed through another adiabatic bed (if any), by heat exchange with a flue gas from said fired furnace; and

(ii) for the reheating step (d), wherein said partially reformed gas is re-heated before said partially reformed gas is fed to said outer tubes, by heat exchange with said reformed gas after passage of said reformed gas through said inner tubes and before any further processing thereof, or with said flue gas from said fired furnace.

4,985,232

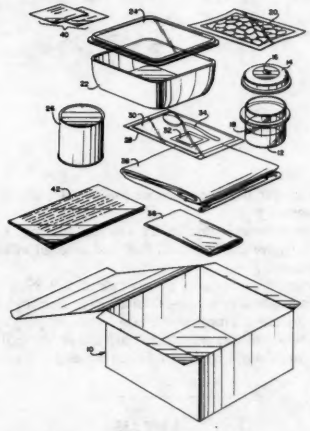
GASTRIC EMPTYING KIT

Patrick C. Jacobsen, Fairhope, Ala., assignor to Insight Concept Innovation & Invention Center, Daphne, Ala.

Filed May 5, 1989, Ser. No. 347,723

Int. Cl.[5] A61B *6/00*; B65D *69/00*; A23C *1/06*; A61M *36/14*

U.S. Cl. 424—4.1 **18 Claims**



1. A solid meal gastric emptying kit for use in a standardized nuclear gastric imaging procedure comprising:

(a) a first container and associated lid;

(b) a package of freeze-dried beef for tagging with a radioactive isotope;

(c) a second mixing and serving container; and

(d) a can of food for mixing with the freeze-dried beef, wherein said lid is further provided with resilient injection port means for receiving an injection of said radioactive isotope upon placement of said freeze-dried beef in said first container.

4,985,233

A DIAGNOSTIC AGENT CONTAINING A NON-RADIOACTIVE PARAMAGNETIC METAL SPECIES IN A MACROMOLECULAR CARRIER

Jo Klaveness; Trond Jacobsen, both of Oslo, Norway, and Bernt J. Lindberg, Storvreta, Sweden, assignors to Nycomed /AS, Oslo, Norway

Filed Nov. 1, 1985, Ser. No. 793,899

Claims priority, application Sweden, Nov. 1, 1984, 8405500; Nov. 1, 1984, 8405501

Int. Cl.[5] A61K *49/00*

U.S. Cl. 424—9 22 Claims

1. A method of diagnosis which method comprises administering to a human or a non-human animal body or to a selected region thereof a contrast effective amount of a diagnostic agent comprising a physiologically tolerable, water insoluble, water-swellable, hydroxyl group containing, particulate macromolecular product which is cross-linked to form a three-dimensional network and carries within cavities therein at least one non-radioactive paramagnetic metal species, said product comprising at least one water-insoluble material selected from the group consisting of polysaccharides, polymerized sugar alcohols and derivatives thereof; and generating an NMR or ultrasound image of said region.

4,985,234

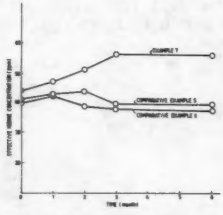
IODINE MICROBICIDE COMPOSITE

Yoshiaki Nakamura; Ryoichi Fujibayashi, and Yuji Murakami, all of Osaka, Japan, assignors to Sunstar Kabushiki Kaisha, Osaka, Japan

Filed Nov. 8, 1988, Ser. No. 268,411

Int. Cl.[5] A61L *9/04*

U.S. Cl. 424—45 4 Claims



1. A substantially non-aqueous iodine microbicide composition comprising

(a) a providone-iodine in an amount of from 0.0005% to 1.0% by weight based on the total amount of said composition, and

(b) a solvent comprising a lower alcohol having from 1 to 3 carbon atoms or a mixture of a lower alcohol having from 1 to 3 carbon atoms and a non-hydrated polyhydric alcohol, wherein the amount of said lower alcohol is 80% by weight or more based on the total weight of said composition.

4,985,235

TREATMENT OF PERIODONTOCLASIA WITH RETINOIC ACID

Albert M. Kligman, c/o Department of Dermatology, University of Pennsylvania, 36th & Hamilton Walk, Philadelphia, Pa. 19104

Continuation of Ser. No. 227,383, Aug. 2, 1988, abandoned. This application May 8, 1989, Ser. No. 349,978

Int. Cl.[5] A61K *7/16*

U.S. Cl. 424—49 17 Claims

1. A method of retarding and reversing periodontoclasia and gingivitis, which comprises topically applying to human gingiva retinoic acid in an amount and for a period of time effective to retard and reverse said periodontoclasia and gingivitis, said amount being insufficient to be excessively irritating.

4,985,236

TRIPOLYPHOSPHATE-CONTAINING ANTI-CALCULUS TOOTHPASTE

Nader Ibrahim, Hackettstown, and Jeanette L. Sodano, Clifton, both of N.J., assignors to Beecham Inc., Clifton, N.J.

Continuation-in-part of Ser. No. 348,805, May 8, 1989, Pat. No. 4,923,684. This application Sep. 14, 1989, Ser. No. 407,336

The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.

Int. Cl.[5] A61K *9/16, 9/18*

U.S. Cl. 424—52 20 Claims

1. A toothpaste, which comprises at least about 4% by weight, based on the total weight of the toothpaste, of a water-soluble alkali metal tripolyphosphate, a phosphatase enzyme inhibitor consisting of a fluoride ion source in an amount sufficient to supply from about 25 ppm to about 3500 ppm of fluoride ion, a silica or plastics dental abrasive and an orally acceptable vehicle, the toothpaste having a pH of from about 8 to about 10.

4,985,237

BENZYLIDENE COMPOUNDS, COSMETIC COMPOSITIONS CONTAINING THE SAME AND ULTRAVIOLET ABSORBER COMPRISING THE SAME

Kazuhiro Matsuno; Toru Kobayashi; Takeshi Miyoshi, and Hideaki Kawashima, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

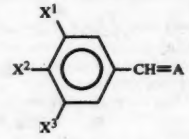
Division of Ser. No. 38,364, Apr. 14, 1987, Pat. No. 4,797,493. This application Oct. 18, 1988, Ser. No. 259,257

Claims priority, application Japan, Apr. 22, 1986, 61-92481; Oct. 16, 1986, 61-246308; Oct. 16, 1986, 61-246309; Nov. 14, 1986, 61-271287

Int. Cl.[5] A61K *7/021, 7/42, 9/10, 9/12*

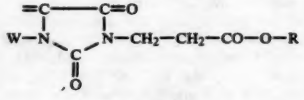
U.S. Cl. 424—59 10 Claims

1. An ultraviolet absorber composition comprising an inert carrier and an effective amount of at least one compound of the formula (I)



(I)

wherein A represents



wherein:

W is a hydrogen atom or a group —CH_2—CH_2—CO—O—R;

X^1, X^2 and X^3 each represents independently a hydrogen atom, a hydroxyl group or a methoxy group, wherein two or three of X^1, X^2 and X^3 are the same of all are different; and

R is a straight chain alkyl group having 1 to 18 carbon atoms, or a branched or a cyclic alkyl group having 3 to 18 carbon atoms,

provided that when X^1, X^2 an X^3 are a hydrogen atom, R is a straight chain, a branched or a cyclic alkyl group having 3 to 18 carbon atoms.

4,985,238

LOW RESIDUE ANTIPERSPIRANT STICKS

Paul R. Tanner; Randolph G. Nunn, Jr., both of Cincinnati, Ohio, and John P. Luebbe, Lawrenceburg, Ind., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 14, 1989, Ser. No. 323,523
Int. Cl.[5] A61K *7/32, 7/34, 7/36, 7/38*
U.S. Cl. 424—66 11 Claims

1. A suspensoid low residue antiperspirant stick composition, substantially free of water and containing from 0 to about 4% of total particulate materials other than the antiperspirant active, comprising:

(a) from about 30% to about 70% of a volatile silicone material;

(b) from about 5% to about 35% of a particulate antiperspirant active;

(c) from about 3% to about 20% of a non-volatile paraffinic hydrocarbon fluid selected from the group consisting of mineral oils, branched chain hydrocarbons containing an average of from about 20 to about 40 carbon atoms, and mixtures thereof; and

(d) from about 10% to about 20% of a low melting point wax.

4,985,239

MICROLATEX HAIR COSMETIC COMPOSITION

Kazuyuki Yahagi, Tokyo, and Toshio Suzuki, Ichikawa, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Division of Ser. No. 902,651, Sep. 2, 1986, Pat. No. 4,798,721.
This application Sep. 26, 1988, Ser. No. 249,777
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[5] A61K *7/06, 4/06*
U.S. Cl. 424—70 8 Claims

1. A hair cosmetic composition comprising from 0.01 to 10% by weight of a particulate latex polymer of water-insoluble monomers, said polymer selected from the group consisting of polystyrenes, copolymers of styrene with at least one vinyl monomer other than styrene, polyamides, polyurethanes, ethoxy resins and polymethyl methacrylates, wherein said particulate polymer has a weight average diameter of from 0.005 to 0.2 microns a particle size distribution such that greater than 95% by weight of the particles have a diameter greater than 0.005 to 0.2 microns and wherein said particulate polymer has a glass transition temperature greater than 300° K.

4,985,240

ODOR-FREE PERM

Daniel J. Halloran, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Feb. 20, 1990, Ser. No. 482,123
Int. Cl.[5] A61K *7/09;* A45D *7/04*
U.S. Cl. 424—71 3 Claims

1. A method of perming hair comprising

(A) reducing the hair by applying to the hair a solution comprising a metal siliconate of the general formula

$$R_a—Si—(O^-M^{30})_{4-a}$$

wherein each R is independently selected from a saturated or unsaturated alkyl group containing 1 to 6 carbon atoms, an aryl group containing 6 to 10 carbons, a halogen atom, a haloalkyl group containing 1 to 6 carbons, and an acryloxy group of the general formula

$$R^1—\overset{O}{\overset{\|}{C}}—O—R^2—$$

where R^1 is selected from an alkyl group containing 1 to 6 carbon atoms, an aryl group containing 6 to 10 carbons and is selected from a saturated alkylene group containing 1 to 6 carbon atoms, and an arylene group containing 6 to 10 carbons; M is selected from an alkali metal, an alkaline earth metal and ammonium compounds; and a has the value of 0 to 3; and

(B) oxidizing the hair by applying to the hair an oxidizing agent.

4,985,241

THERAPEUTIC COMBINATION OF FREE-RADICAL SCAVENGER AND TUMOR NECROSIS FACTOR

Robert Zimmerman, Lafayette, and Benedict J. Marafino, Jr., San Francisco, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation of Ser. No. 113,643, Oct. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 933,475, Nov. 21, 1986, abandoned. This application Aug. 25, 1989, Ser. No. 399,386
Int. Cl.[5] A61K *37/02*
U.S. Cl. 424—85.1 17 Claims

1. A composition suitable for administration to mammalian hosts for therapeutic or prophylactic treatment of biological damage to the host caused by free radical generation, which composition comprises a mixture, in pharmacologically effective amounts, of Tumor Necrosis Factor from a mammalian species and at least one biological modifier that is a free radical scavenger selected from the group consisting of buthionine sulphoximine, uric acid or vitamin C, or combinations of one or more of these modifiers.

4,985,242

INTRANASALLY APPLICABLE POWDERY PHARMACEUTICAL COMPOSITION

Kunio Sekine; Daisuke Araki, and Yoshiki Suzuki, all of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 832,932, Feb. 25, 1986, abandoned.
This application Dec. 14, 1987, Ser. No. 132,447
Claims priority, application Japan, Feb. 25, 1985, 60-34581
Int. Cl.[5] A61K *37/66, 39/00, 37/00, 37/26*
U.S. Cl. 424—85.4 12 Claims

1. An intranasally applicable powdery pharmaceutical composition comprising a pharmaceutically effective amount of a polypeptide having a physiological activity and about 0.001% to 12% by weight, based on the total weight of the composition, of at least one quaternary ammonium compound selected from the group consisting of benzalkonium chloride, benzethonium chloride, cetyl trimethyl ammonium bromide, and dodecyl dimethyl ammonium bromide in at least one lower alkyl ether of cellulose selected from the group consisting of hydroxypropyl cellulose, methyl cellulose, hydroxyethyl cellulose and hydroxpropylmethyl cellulose.

4,985,243

COMPOSITION AND METHOD FOR PROTECTING AGAINST DISEASES CAUSED BY MICROORGANISMS

Daryl H. Faulds, and Mimi Vishoot, both of Millbrae, Calif., assignors to ML Technology Ventures, L.P., New York, N.Y.

Filed Jan. 20, 1988, Ser. No. 146,256
Int. Cl.[5] A61K *39/305, 39/00, 37/54;* C12N *9/22*
U.S. Cl. 424—85.8 14 Claims

1. A method for protecting an animal against *M. hyopneumoniae*, comprising:

administering to the animal at least one nuclease or fragment or derivative thereof which produces antibodies having paratopes which recognize extrinsic nuclease of *M. hyopneumoniae*, in an amount effective to protect said animal against *M. hyopneumoniae*.

4,985,244

STABILIZED LIVE ATTENUATED VACCINE AND ITS PRODUCTION

Satoshi Makino; Keiko Sasaki, both of Kanagawa, and Masaharu Nakagawa, Tokyo, all of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Filed Jun. 8, 1988, Ser. No. 203,411
Claims priority, application Japan, Jun. 8, 1987, 62-142465
Int. Cl.[5] A61K *39/12*; C12N *7/00*
U.S. Cl. 424—89 3 Claims

1. A stabilized live attenuated vaccine, which comprises a live attenuated plain vaccine consisting of measles, mumps or rubella virus grown in a medium-199 for cell culture, or a combined live attenuated vaccine thereof, in admixture with a stabilizing agent which is a combination consisting essentially of lactose 2.5–5 W/V%, saccharose 2.5–5 W/V%, D-sorbitol 1.8–2 W/V%, sodium glutamate about 0.1 W/V% and gelatin hydrolyzate, M.W. approx. 35,000, 2–3 W/V%.

4,985,245

TPA-CONTAINING MEDICAL COMPOSITION

Fumio Kakimoto; Naoki Asakawa; Yasuo Ishibashi, all of Gifu, and Yasuo Miyake, Aichi, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 32,585, Apr. 1, 1987, abandoned. This application Nov. 3, 1989, Ser. No. 430,949
Claims priority, application Japan, Apr. 2, 1986, 61-74370
Int. Cl.[5] A61K *37/547*, *31/13*
U.S. Cl. 424—94.3 6 Claims

1. A medical composition containing a tissue Plasminogen Activator (tPA, which comprises tPA and meglumine or a salt thereof.

4,985,246

COMPOSITION OF FEEDSTUFF

Shigeo Okonogi, Tokyo; Mamoru Tomita; Seiichi Shimamura, both of Yokohama; Toshio Tomimura, Chiba; Norio Ishibashi, Tokyo; Hiroshi Miyakawa, Kamakura, and Koichi Sugawara, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1986, Ser. No. 924,763
Claims priority, application Japan, Oct. 31, 1985, 60-244799
Int. Cl.[5] A61K *35/00*
U.S. Cl. 424—115 15 Claims

1. A feedstuff composition containing at least 0.50 wt. % in solid content of a residual liquid of an incubated culture broth of Bifidobacteria, lactic acid bacteria, or both, which residual liquid is obtained by substantially excluding the microbial cell mass from said incubated culture broth.

4,985,247

PHARMACEUTICAL COMPOSITION FOR INHIBITING VIRUSES AND INCREASING IMMUNE FUNCTION (PII)

Yaguang Liu, 67-08 168th St., Flushing, N.Y. 11365

Division of Ser. No. 6,736, Jan. 27, 1987, Pat. No. 4,886,666. This application Aug. 21, 1989, Ser. No. 396,333
Int. Cl.[5] A61K *35/78*
U.S. Cl. 424—195.1 1 Claim

1. A process for producing Guanzhongsu from powdered roots and stems of a plant selected from the group consisting of *Dryopteris crassirhizoma* Nakai, *Osmunda japonica* Thunb, *Lunathyrium acrostichoides* Ching and *Matteuccia stuthiopteris* Todaro comprising:

(a) extracting said powder with boiling water and simmering the mixture for 30 minutes;
(b) separating the extract from the powder;
(c) concentrating the extract to half of its original volume;
(d) adding 95% ethanol to the concentrated extract to make a 75% ethanol solution;
(e) filtering the 75% ethanol solution to yield an ethanol filtrate and a residue;
(f) concentrating the filtrate under reduced pressure and mixing with water;
(g) concentrating the aqueous solution under reduced pressure and allowing the concentrated solution to form a precipitate at 4 degrees C.;
(h) recovering said precipitate from an aqueous filtrate and vacuum drying to yield Guanzhongsu;
(i) mixing 1N NaOH with the separated aqueous filtrate of (h) to form a first extract;
(j) extracting the residue of (e) with 1N sodium hydroxide and recovering a second extract;
(k) neutralizing the first and second filtrate with 1N HCl and allowing the resulting solution to preciptate at 4 degrees C.; and
(l) recovering the precipitate followed by vacuum drying.

4,985,248

PHARMACEUTICAL COMPOSITION CONTAINING A SAFE EXTRACTS OF FRUITS AND VEGETABLES FOR THE TREATING AND PREVENTING OF DIABETES

Yaguang Liu, 67-08 168th St., Flushing, N.Y. 11365

Continuation of Ser. No. 63,978, Jun. 18, 1987, abandoned. This application Aug. 16, 1989, Ser. No. 394,558
Int. Cl.[5] A61K *35/78*, *31/70*
U.S. Cl. 424—195.1 4 Claims

1. A pharmaceutical composition for the treatment of diabetes comprising:

oleanolic acid 5–30 wt. %;
saponins of litchi 10–50 wt. % and
Kuguasu 30–90 wt. %.

4,985,249

ANTI-HIV AGENTS

Hiroshi Sakagami; Kunio Konno, and Meihan Nonoyama, all of c/o Medical Department, Showa University of 1-5-8, Hatanodai, Shinagawa-ku, Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 209,926
Claims priority, application Japan, Jun. 26, 1987, 62-159423; Mar. 19, 1988, 63-662252
Int. Cl.[5] A61K *35/78*
U.S. Cl. 424—195.1 11 Claims

1. Anti-HIV agents containing as active components extract which has been extracted with alkaline water from pine cone.

4,985,250

EMULSIONS

Rodney D. Bee, Cambridgeshire; Ian D. Evans, Bedford, and Martin J. Izzard, Northants, all of England, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Jun. 5, 1989, Ser. No. 361,051
Claims priority, application United Kingdom, Jun. 3, 1988, 8813161
Int. Cl.[5] A61K *6/00*
U.S. Cl. 424—401 7 Claims

1. A gelled duplex emulsion structure consisting essentially of:

(i) 0.1% to about 40% by weight of a gelled external continuous aqueous phase comprising a gelling component selected from gelatin, meat, egg protein, fish protein, gelling polysaccharides and clays;
(ii) oil or liquid fat component from about 5% to about 30% by weight selected from olive oil, palm oil, groundnut oil, sunflower oil and animal fats dispersed in the external phase; (and)
(iii) an aqueous phase containing an osmotic pressure component selected from peptides and urea and dispersed in the oil or fat phase-
(iv) an internal emulsifier in a sufficient amount to stabilize the water in oil emulsion having a hydrophilic-lipophilic balance (HLB) of not more than 6 and
(v) a sufficient amount of an external oil/water emulsifer having an HLB of at least 8.

4,985,251

FLOWABLE INSECTICIDAL DELIVERY COMPOSITIONS AND METHODS FOR CONTROLLING INSECT POPULATIONS IN AN AQUATIC ENVIRONMENT

Richard Levy, Fort Meyers, Fla., assignor to Lee County Mosquito Control District, Fort Meyers, Fla.

Continuation-in-part of Ser. No. 32,532, Apr. 1, 1987, Pat. No. 4,818,534. This application Jun. 24, 1988, Ser. No. 210,801

Int. Cl.[5] A01N *25/34;* A61K *9/14*

U.S. Cl. 424—404 11 Claims

1. A controlled release variable-viscosity, flowable insecticidal delivery composition for controlling a population of aquatic environment insects in preflood or flood conditions comprising:

(a) at least one superabsorbent solid organic polymer comprising hydrophilic acrylamide or acrylate polymers, co-polymers or ter-polymers which absorb over 100 times their weight in water,

(b) at least one insecticidal agent, and

(c) water or oil, said polymer, agent and water or oil being present as a flowable formulation wherein the agent is present in a total amount effective to control the population of aquatic environment insects and wherein said composition is an admixture formed by mixing the superabsorbent polymer, the insecticidal agent, and the water or oil.

4,985,252

MEDICATION, DIETETIC PRODUCT AND HYGIENIC PRODUCT IN THE FORM OF A POWERED COMPOSITION OBTAINED BY ADSORPTION OF ACTIVE INGREDIENTS ON A RAPIDLY DISSOLVING SUGAR AND PROCESS FOR OBTAINING SAID COMPOSITION

Christophe Jung, and Jean Jung, both of Strasbourg, France, assignors to R. I. Ph. Recherche Informatique et Pharmacie (S.A.R.L.), Strasbourg, France

Filed Apr. 4, 1988, Ser. No. 183,263

Claims priority, application France, Apr. 7, 1987, 87 04985

Int. Cl.[5] A61K *9/14, 9/16, 31/70, 47/00*

U.S. Cl. 424—439 10 Claims

1. A powdered composition, characterized in that it consists essentially of at least one medically active ingredient adsorbed on the external and/or internal surface of particles of instant sugar selected from the group consisting of sucrose, glucose and lactose, produced by evaporating an organic solvent solution of said active ingredient containing said instant sugar dispersed therein, said organic solvent solution comprising an organic solvent not dissolving said instant sugar.

4,985,253

SUSTAINED RELEASE COMPOSITION FOR PHARMACEUTICAL SUBSTANCES COMPRISING A SILICONE ELASTOMER CARRIER

Keiji Fujioka, Amagasaki; Shigeji Sato, Ibaraki; Nobuhiko Tamura, Toyonaka, and Yoshihiro Takada, Takatsuki, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

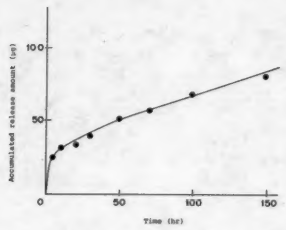
Continuation of Ser. No. 917,471, Oct. 10, 1986, abandoned. This application Feb. 16, 1990, Ser. No. 481,722

Claims priority, application Japan, Oct. 11, 1985, 60-227590; Sep. 19, 1986, 61-223250; Sep. 19, 1986, 61-223251

Int. Cl.[5] A61K *9/14;* A61F *13/00*

U.S. Cl. 424—488 24 Claims

1. A sustained release composition comprising a silicone elastomer matrix, a pharmaceutical substance uniformly mixed in said matrix and albumin to provide sustained release of said pharmaceutical substance from said silicone elastomer matrix



and stabilize said pharmaceutical substance in said silicone elastomer matrix.

4,985,254

METHOD OF TREATING ISCHEMIC DISEASES

Jin-emon Konishi, Hyogo, Japan, assignor to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed Nov. 3, 1988, Ser. No. 266,758

Claims priority, application Japan, Nov. 6, 1987, 62-281764

Int. Cl.[5] A61K *35/12, 35/36*

U.S. Cl. 424—520 3 Claims

1. A method for treating Raynaud's disease which comprises administering to an animal in need of such treatment an effective amount of a substance prepared by extracting infected tissue inoculated with a poxvirus, deproteinizing the extract, mixing the deproteinized extract with an adsorbent, eluting the adsorbed material from the adsorbent and fractionation the eluate, said substance being a hygroscopic powder, pale yellowish brown in appearance, soluble in water methanol and acetone and insoluble in benzene and ether, having a molecular weight of 500–5,000 and ultraviolet adsorption of λ max=265–275 nm, and which gives a positive color reaction for amino acid, sugar and phosphorus, and a negative color reaction for protein and phenol.

4,985,255

EXTERNAL PREPARATIONS OF MELANOGENESIS-INHIBITORY AGENT

Yoshitaka Higa, Dazaifu, Japan, assignor to Sansho Seiyaku Co., Ltd., Fukuoka, Japan

Filed Apr. 18, 1988, Ser. No. 182,621

Int. Cl.[5] A61K *35/50, 31/35*

U.S. Cl. 424—583 2 Claims

1. An external preparation of a melanogenesisinhibitory agent comprising, as active ingredients, a placental extract of pregnant cows and kojic acid or a derivative thereof.

4,985,256

METHODS FOR DIAGNOSING, MONITORING AND CONTROLLING THE ONSET AND PROGRESSION OF CERTAIN DEMENTIAS AND IMPEDING MEMORY LOSS OR IMPROVING IMPAIRMENT OF MEMORY

J. Leslie Glick, Potomac, Md., assignor to Bionix Corporation, Potomac, Md.

Division of Ser. No. 203,174, Apr. 27, 1988, Pat. No. 4,837,164. This application Mar. 13, 1989, Ser. No. 322,382

Int. Cl.[5] A61K *33/06, 33/08, 33/10, 33/14*

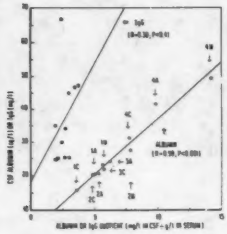
U.S. Cl. 424—697 74 Claims

1. A palliative method for treatment of dementia, wherein said dementia is either AD, MID, ALS-PD or HD, comprising:

(A) orally administering Mg alone or in combination with another anti-dementia agent to a subject whose dietary intake of Mg is below the normal intake of about 200–450

mg/day, such that the supplemental daily intake of Mg in the subject is from about 200 to 1,620 mg, or

(B) parenterally administering Mg alone or in combination



with another anti-dementia agent to a subject whose dietary intake of Mg is below the normal intake of about 200–450 mg/day, wherein the amount of Mg parenterally administered is from about 70 to 540 mg/day.

4,985,257

HEMORRHOIDAL TREATMENT AND COMPOSITION

Giancarlo U. Verde, 9, Via Siria, 00184 Roma, Italy

Filed Jul. 31, 1989, Ser. No. 386,726

Claims priority, application Italy, Feb. 6, 1989, 47616 A/89

Int. Cl.[5] A61K *33/04*

U.S. Cl. 424—705 **11 Claims**

1. A composition of matter comprising as active ingredients for relieving hemorrhoidal symptoms and reducing hemorrhoidal swelling between about 15 and 30 weight percent sulfur and between about 85 and 70 weight percent cream of tartar, based on the combined weight of sulfur and cream of tartar.

4,985,258

PICKLING KIT AND PROCESS

Charles A. Rosen, Atherton, Calif., assignor to Cultured Foods Corporation, Mt. View, Calif.

Filed Dec. 22, 1988, Ser. No. 288,590

Int. Cl.[5] A23L *1/218*

U.S. Cl. 426—8 **2 Claims**

1. A pickling kit for pickling vegetables through lactic acid fermentation comprising:

(a) a container; and

(b) pickling ingredients comprising:

(i) a pre-measured amount of lactic acid-producing bacteria in an amount sufficient for production of acid throughout a fermentation process, said lactic acid-producing bacteria comprising L. Mesenteroides in combination with one of the group consisting of L. Acidophilus, L. Plantarum, and L. Brevis;

(ii) a sufficient amount of acid for providing an initial pH of less than 2.5, said acid comprising at least citric, ascorbic, and sorbic acids;

(iii) nutrients for said lactic acid producing bacteria;

(iv) sufficient salt to provide solution of at least about 5% by weight of salt; and

(v) herbs and spices.

4,985,259

METHOD OF MANUFACTURE OF FERMENTED SOYBEAN FOOD WITHOUT COOKING

Satoshi Nii, 18-7, Seijo 9-chome, Setagaya-ku, Tokyo, Japan

Filed Nov. 24, 1989, Ser. No. 440,811

Claims priority, application Japan, Jan. 18, 1989, 1-9093

Int. Cl.[5] A23L *1/20*

U.S. Cl. 426—46 **2 Claims**

1. A method of manufacturing fermented soybean food without cooking comprising:

breaking soybean into ¼–½ in size to provide roughly broken soybean;

taking off coat and germ from each of said roughly broken soybean;

feeding said roughly broken soybean into a sealed vessel;

introducing steam into said sealed vessel at a preselected pressure for 3–20 minutes to avoid cooking said roughly broken soybean, said preselected pressure being at or under 1 Kg/cm^2;

rapidly discharging said broken soybean from the sealed vessel to outside normal atmospheric pressure so that said broken soybean are puffed;

grinding said puffed broken soybean into powder;

sprinkling hot water at a preselected temperature onto said powder to avoid cooking said powder, said preselected temperature being 80°–95° C.; and

inducing the fermentation of said powder by adding malt and salt;

whereby the fermented soybean food is void of any odor of miso and has effective nutriment contained in the soybean due to manufacture thereof without cooking.

4,985,260

FOOD BODY WITH SURFACE COLOR INDICIA

Vitas Niaura, 5503 Grand Ave., Western Springs, Ill. 60558; Jeffery A. Oxley, 1351 Auburn Ave., Naperville, Ill. 60565, and Elio E. Tarika, 323 Frogtown Rd., New Canaan, Conn. 06840

Continuation-in-part of Ser. No. 191,100, May 6, 1988. This application Mar. 24, 1989, Ser. No. 326,560

Int. Cl.[5] A22C *17/10*

U.S. Cl. 426—87 **102 Claims**

45. A processable food package comprising casing filled with moisture-containing processable food having its moisturized outer surface in direct contact with the casing inner surface wherein said inner surface has thereon a desired indicia comprising a water soluble dry colorant under layer in nondiffusible association with said casing inner surface and a binder-sealant layer superimposed over and entirely enclosing the colorant layer top surface in adhering relationship, the binder-sealant perimeter outwardly extending beyond the colorant layer extremities so as to directly contact the surrounding casing inner surface in adhering relationship therewith, and the binder-sealant top surface is in contiguous association with the food outer surface, said binder-sealant having a melting point above about 100° F. and being water insoluble, the binder-sealant covered colorant indicia being substantially completely transferable from the casing inner surface to the moisturized food outer surface during processing thereof in said casing.

4,985,261

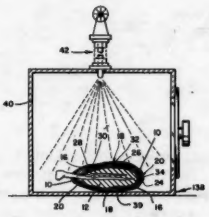
PROCESS FOR MICROWAVE BROWNING PROTEINACEOUS FIBROUS MEAT PRODUCTS

Young C. Kang, Oakhurst; Chee-Teck Tan, Middletown; Brian Byrne, East Brunswick; Lawrence L. Buckholz, Jr, Middletown; Marion A. Sudol, Boonton, and Richard M. Boden, Ocean, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 440,794, Nov. 24, 1989, Pat. No. 4,943,697, which is a division of Ser. No. 356,503, May 25, 1989, , which is a division of Ser. No. 295,450, Jan. 10, 1989, Pat. No. 4,882,184. This application Jun. 8, 1990, Ser. No. 535,524

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—243 22 Claims



1. A process for producing a cooked edibly browned storage-stable fibrous, proteinaceous muscle tissue foodstuff consisting essentially of the steps of:

(a) providing a particulate flowable, flavoring powder consisting essentially of α individually, discretely encapsulated Maillard reaction reagents said encapsulated Maillard reaction reagents being:

(i) at least one encapsulated amino acid;

(ii) at least one encapsulated sugar optionally admixed with at least one Maillard reaction promoter; and, optionally

(iii) at least one encapsulated pH adjustment agent;

and, optionally, β, at least one Maillard reaction promoter;

(b) providing an uncooked fibrous, proteinaceous, muscle tissue foodstuff containing more than 50% of water having an outer uncooked foodstuff surface;

(c) placing in intimate contact with at least a major portion of said uncooked foodstuff surface a flavor augmenting, imparting or enhancing quantity of said particulate flowable flavoring powder thereby forming a flavoring powder-coated foodstuff surface; and

(d) exposing the flavoring powder-coated foodstuff surface to microwave radiation for a predetermined controlled period of time;

whereby the resulting product is caused to be edible as a foodstuff and the cooked, fibrous, proteinaceous muscle tissue foodstuff surface is edibly browned.

4,985,262

PROCESS FOR PREPARING A SNACK PRODUCT

Alexis L. Camire, Flower Mound; Ofomata E. Ejike, Louisville; Kim C. Krumhar, Bedford, and Michael V. Taranto, Carrollton, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed May 25, 1988, Ser. No. 198,555

Int. Cl.[5] A21D *8/00*

U.S. Cl. 426—302 26 Claims

1. A process for preparing a snack product, comprising:

(a) applying an aqueous liquid, a farinaceous flour and oil onto a quantity of snack-sized, extruded farinaceous collets, the collets having an initial weight an aqueous moisture content within the range of about 3–15 weight percent, wherein the aqueous liquid is applied onto the collets in an amount about equal to 5–15 weight percent of the initial weight of the collets, the farinaceous flour is applied onto the collets in an amount about equal to 5–10 weight percent of the initial weight of the collets and the oil is applied onto the collets in an amount about equal to 25–35 weight percent of the initial weight of the collets; and then

(b) baking the collets to reduce the aqueous moisture content of the collets to about 2 weight percent or less.

4,985,263

COATING METHOD FOR FROZEN CONFECTIONERY PRODUCTS

David M. Klug, Fulton, and Vernon R. Merz, Hannibal, both of N.Y., assignors to Nestec S.A., Vevey, Switzerland

Filed Nov. 30, 1989, Ser. No. 444,011

Int. Cl.[5] A23B *4/10;* A23F *3/00*

U.S. Cl. 426—302 15 Claims

1. A process for coating a frozen confectionery product which comprises:

dipping a frozen confectionery product containing calcium ions into a flowable aqueous medium containing an alkali metal alginate to form a coating on the frozen confectionery product, and

spraying an aqueous solution of a calcium salt onto the coating of the coated product.

4,985,264

PROCESS FOR THE PREPARATION OF AN AQUEOUS SOLUTION OF ORGANOLEPTIC CONSTITUENTS AND ITS APPLICATION TO OBTAINING COLORLESS POTABLE SPIRITS OF THE WHISKEY TYPE

Andé C. Clauzure, Chemin des Cotes, France, assignor to Pernod Ricard, Paris, France

Filed Jul. 20, 1989, Ser. No. 382,984

Claims priority, application France, Jul. 25, 1988, 88 10001

Int. Cl.[5] C12G *3/00*

U.S. Cl. 426—330.4 9 Claims

1. A process for the preparation of a colorless aqueous solution of the organoleptic constituents of a starting potable spirit which has been aged in wood, comprising the following steps:

(a) decolorizing the potable spirit by putting it into contact with an activated charcoal, either by adding the activated charcoal to the potable spirit to be decolorized, or by percolating the potable spirit though activated charcoal placed in a column,

(b) separating the activated charcoal from the potable spirit so decolorized,

(c) distilling water over the activated charcoal separated from the decolorized potable spirit thereby to form a distillate which is a colorless aqueous solution of organoleptic constituents from the starting potable spirit, and

(d) recovering the distillate formed in step c.

4,985,265

PROCESS FOR EXTRACTION OF SPICES

Soraya Duboc, Paris; Henri Renon, Sceaux; Serge Laugier, Danmarie-Les-Lys; Jean-Luc Mizandjian, Igny, and Jean-Louis Pean, Montlhery, all of France, assignors to L'Air Liquide, Society Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation of Ser, No. 239,668, Sep. 2, 1988, abandoned. This application Dec. 12, 1989, Ser. No. 449,448

Claims priority, application France, Jun. 17, 1988, 88 08115

Int. Cl.[5] A23L *1/221*

U.S. Cl. 426—425 14 Claims

1. A process for extracting piperine and aromatic compounds of peppercorns comprising extracting said compounds in liquid carbon dioxide in the presence of an alimentarily acceptable cosolvent which does not degrade the flavors of the pepper, said cosolvent being selected from the group consisting of hydrocarbons having up to four carbon atoms, aliphatic alcohols having from two to four carbon atoms, and ethers the temperature and pressure conditions being controlled at temperatures less than 1° C. above the critical temperature of the carbon dioxide and at pressures between 20 and 150 bars, such

that the carbon dioxide—cosolvent mixture remains in the liquid monophase state.

4,985,266

PROCESS FOR PRODUCING FRIED FOOD

Ken Sakuma, Matsudo, Japan, assignor to Kenji Kenji Sakuma, Matsudo, Japan

Continuation of Ser. No. 135,414, Dec. 21, 1987, abandoned, which is a division of Ser. No. 894,237, Aug. 6, 1986, Pat. No. 4,732,081. This application Aug. 30, 1989, Ser. No. 401,550
Claims priority, application Japan, Aug. 19, 1985, 60-180583
Int. Cl.[5] A23L *1/01*
U.S. Cl. 426—438 2 Claims

1. A process for producing fried food, comprising the steps of:

(a) placing pieces of a food material suitably pretreated into a vessel filled to an intermediate level with heated oil;

(b) creating a vacuum in the vessel;

(c) performing a first vacuum frying phase by immersing the material in the oil, then moving the material vertically for several cycles at a first repetition rate to alternately withdraw the material above the surface of the oil and dip the material into the oil for short periods of time, then allowing the material to rest submerged in the heated oil for a period of time substantially longer than said short periods of time, and repeating the moving operation and resting operation several times in sequence so as to partially dry the food while preventing adhesion between pieces;

(d) performing a second vacuum frying phase by alternately repeating each of the moving operating and resting operation at a second repetition rate of longer time periods than said first repetition rate, to further dry the material without breakage of pieces;

(e) performing a third vacuum frying phase by allowing the material to remain immersed for a time period sufficient to attain a desired final water content; and

(f) vibrating the material with small amplitude vibrations while held above the oil surface to remove oil therefrom.

4,985,267

METHOD OF PRODUCING DRIED FOOD

Graciela De Cuadros, 836 Y Rumichaca, 4 to Piso, (Ultima Escalera), Guayaquil, Ecuador

Filed May 9, 1990, Ser. No. 521,034
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—473 13 Claims

1. A method of producing dried food, said method comprising the steps of:

(a) cooking food to be dried at between approximately 90° F. and approximately 110° F. for approximately 30 minutes; then

(b) grinding the cooked food into chunks; then

(c) cooking the chunks at between approximately 90° F. and approximately 110° F. for approximately 24 hours, thereby drying the food; then

(d) reducing the dried chunks to fine powder; and then

(e) cooking the dried powder at between approximately 70° F. and approximately 90° F. for approximately 12 hours.

4,985,268

METHOD FOR PROCESSING PINEAPPLES

David W. Bingham, Brighton, Australia, assignor to Pitters Pty. Ltd., Australia

Filed Dec. 7, 1989, Ser. No. 447,510
Claims priority, application Australia, Dec. 9, 1988, PJ1900
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—482 7 Claims

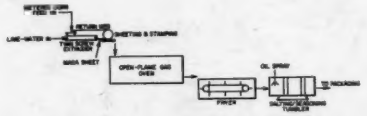
1. A method of processing a pineapple including the steps of dividing the pineapple transversely of its longitudinal axis to form a plurality of separated discs, grading the discs according to diameter, conveying each graded disc to one of a plurality of tubular cutters, the cutter to which each individual disc is conveyed having a diameter a predetermined extend smaller than the diameter of the disc, and removing the skin of the pineapple from the circumferential periphery of each disc with the respective tubular cutter.

4,985,269

CONTINUOUS EXTRUSION FOR TORTILLA CHIP PRODUCTION

Scot A. Irvin, Baldwinsville; Robert A. Fedor, Fayetteville, and Carleton G. Merritt, Phoenix, all of N.Y., assignors to Borden, Inc., Columbus, Ohio

Filed Jun. 12, 1990, Ser. No. 536,727
Int. Cl.[5] A23L *1/00*; A23P *1/00*
U.S. Cl. 426—560 34 Claims



1. A continuous process for making a corn masa dough suitable for deep fat frying which comprises the steps of:

a. providing non-hydrated corn feed, water, and an alkalizing agent to a cooker-extruder, the quantity of alkalizing agent being sufficient to provide the resulting dough with a pH of about 5.5 to 8.5 and the quantity of water being sufficient to provide a total moisture content of about 25 to 35% by weight of the material provided to the extruder;

b. mixing the water, alkalizing agent, and corn while subjecting said mixture to low shear forces to prepare a dough;

c. providing external heat as well as heat from intense mixing, shearing, and kneading to cook said dough;

d. cooling the dough and then expelling the dough from the extruder while the extruder operates with: a Residence Time Distribution of 175 to 400 seconds; a Specific Mechanical Energy Input of 300 to 550 watt hours per kilogram; a Shear Rate of 65 to 140 reciprocal seconds; and a Peak Temperature of 230 to 270 degrees F.

4,985,270

CREAM SUBSTITUTE INGREDIENT AND FOOD PRODUCTS

Norman Singer, Highland Park, Ill.; Reed Wilcox, Littleton, Colo.; Joseph S. Podolski, Skokie, Ill.; Hsien-Hsin Chang, Lake Zurich, Ill.; Suseelan Pookote, Buffalo Grove, Ill.; John M. Dunn, Buffalo Grove, Ill., and Leora Hatchwell, Buffalo Grove, Ill., assignors to The Nutrasweet Company, Deerfield, Ill.

Continuation-in-part of Ser. No. 148,434, Jan. 26, 1988, Pat. No. 4,855,156, which is a continuation-in-part of Ser. No. 127,709, Dec. 2, 1987. This application Sep. 19, 1988, Ser. No. 246,421
Int. Cl.[5] A23G *9/00*; A23L *1/19*; A23J *3/00*
U.S. Cl. 426—515 43 Claims

1. A cream substitute food ingredient comprising substantially non-aggregated speroidally shaped macrocolloidal particles comprising:

(a) a coagulable protein; and

(b) a nucleating agent,

wherein the coagulable protein is denatured around the nucleating agent to form substantially non-aggregated, spheroidally shaped macrocolloidal particles having in a dry state a mean particle size distribution ranging from about 0.1 microns to about 2.0 microns, with less than about 2 percent of the total number of particles exceeding 3.0 microns in diameter, and wherein the majority of said particles are generally spheroidal as viewed at about 800 power magnification under a standard light microscope, the particles in a hydrated state forming a macocolloid

having substantially smooth, emulsion-like organoleptic character.

4,985,271

PROCESS FOR TREATING COFFEE BEANS TO MAKE A BETTER-TASTING COFFEE

Diane H. R. Nelson, Fairfield, Ohio; Sara L. R. Work, Dry Ridge; Edward L. Whaley, Cincinnati, Ohio; Steven J. Kirkpatrick, Cincinnati, Ohio, and James P. McCarthy, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 254,991, Oct. 7, 1988, abandoned, which is a division of Ser. No. 179,704, Apr. 11, 1988, Pat. No. 4,857,351, which is a continuation-in-part of Ser. No. 944,140, Dec. 19, 1986, abandoned. This application Jun. 29, 1990, Ser. No. 546,604

Int. Cl.[5] A23F *5/04*

U.S. Cl. 426—595 **13 Claims**

1. A process for treating coffee beans to make a better-tasting coffee, comprising the steps of:

(a) partially roasting green coffee beans to a Hunter a-color between about 3 and about 9, under roasting conditions sufficient to increase the Hunter a-color of the beans by at least about 1.5 a-color units during the partial roasting; then

(b) treating the partially roasted beans with an aqueous alkaline solution comprising water and a foodgrade base, at a temperature between about 40° F. (4° C.) and about 350° F. (177° C.) for a time between about 5 seconds and about 48 hours; and then

(c) final roasting the treated beans to a Hunter L-color between about 16 and about 24, under roasting conditions sufficient to lower the Hunter L-color of the beans by at least about 10 L-color units during the final roasting step.

4,985,272

FAT-CONTAINING COMPOSITIONS HAVING A LOW PHOSPHATIDE CONTENT

Paulus A. M. Grootscholten, Anjer 47, 2678 PC De Lier, and Gerrit L. Van Der Schee, Siriusstraat 11, 3235 PL Rockanje, both of Netherlands

Filed Feb. 9, 1989, Ser. No. 308,213

Claims priority, application Netherlands, Feb. 9, 1988, 8800299

Int. Cl.[5] A23D *9/00*

U.S. Cl. 426—609 **11 Claims**

1. A frying fat composition having improved anti-spattering behavior and a reduced browning tendency on heating above 100° C., said composition consisting essentially of fat and an anti-spattering amount of an additive consisting essentially of phosphatidyl choline PC, lysophosphatidyl ethanolamine LPE, phosphatidyl inositol PI and phosphatidyl ethanolamine PE, and from no sugar up to an amount not in excess of the amount of PC present, the amount of said additive being less than 0.1 wt. %, based on the weight of fat and said additive composition being such as to meet the following criteria in weigh percentage based on the weight of fat in said composition:

$$PC+LPE+PI>0.003 \text{ wt. \%}$$

and

$$PE+LPE<0.003 \text{ wt. \%}.$$

4,985,273

METHOD OF PRODUCING FINE INORGANIC PARTICLES

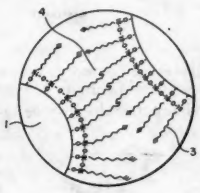
Norihisa Mino, Settsu, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 5, 1989, Ser. No. 361,261

Claims priority, application Japan, Jun. 7, 1988, 63-139978; Jun. 28, 1988, 63-160062; Feb. 27, 1989, 1-45999

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—35 **27 Claims**



1. A method of producing a mass of inorganic fine particles, which comprises the steps of reacting the inorganic fine particles on the entire surface thereof with a silane type surface active agent containing a straight hydrocarbon chain and a junctional group to form a monomolecular film on the entire surface of said inorganic fine particles, thereafter making the organic fine particles covered with the monomolecular film in a predetermined density on a substrate, and thereafter subjecting the monomolecular film to physical or chemical treatment to allow the functional groups to be chemically bonded to each other.

4,985,274

METHOD FOR CONTROLLING RELEASE FORCES IN RELEASE COATINGS

Antony P. Wright, Midland County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 391,264, Aug. 9, 1989, abandoned. This application May 9, 1990, Ser. No. 520,942

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—38 **9 Claims**

1. A process for controlling release forces of radiation curable release coatings comprising controlling the amount of oxygen, wherein said oxygen is reactive with said coating, by the introduction of a reducing gas, wherein said reducing gas is reacted with oxygen in the presence of electron beam radiation.

4,985,275

METHOD FOR PRODUCING A FUSED SILICA ENVELOPE FOR DISCHARGE LAMP

Tetsu Takemura, Himeji; Hidetoshi Ichinose, Fujisawa; Keisuke Ohkubo, Himeji; Akihiko Sugitani, and Toshiyuki Okamoto, both of Takasago, all of Japan, assignors to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 870,960, Jun. 5, 1986, abandoned. This application Sep. 8, 1989, Ser. No. 405,571

Int. Cl.[5] B05D *5/12, 7/22, 3/02*

U.S. Cl. 427—106 **4 Claims**

1. A method for producing an envelope for a discharge lamp, comprising the steps of:

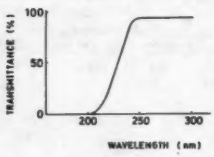
coating an inner surface of a fused silica tube with a formulation containing a titanium alcoholate;

drying the coated tube;

heating the dried coated tube at a temperature of at least 250° C. for approximately 10 minutes;

baking the coated tube at a temperature of at least 1720° C. to cause TiO_2 to diffuse into the tube to provide a Ti

concentration of 0.5–7% by weight in terms of TiO_2, from the inner surface of the tube to a depth of at least 1 μm but not greater than 10 μm into the tube, and so that the product



of the overall average Ti concentration and the thickness of the tube ranges from 3.7 μm to 42% μm; and

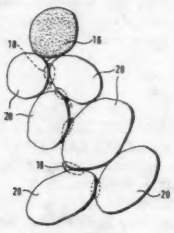
forming a bulb-like portion by inflating the silica tube during said baking step.

4,985,276

PROCESS FOR HARDENING BALLASTS AND OTHER HEAPED STRUCTURES

Karl R. Zeiss, Freiburg, and Paul Degen, Buhlertal, both of Fed. Rep. of Germany, assignors to Messer Griesheim, Fed. Rep. of Germany

Filed Dec. 23, 1989, Ser. No. 456,523
Int. Cl.[5] B05D *3/04*
U.S. Cl. 427—136 **8 Claims**



1. In a process for hardening ballasts and heaped structures by means of an adhesive which is pourable at the ambient temperature, the improvement being in that the adhesive is first transformed into the solid state by means of cooling, and the solid adhesive is applied onto the heaped structure and time-dosed by the thawing of the cooled adhesive.

4,985,277

METHOD OF MAKING TACK-FREE SILICONE GEL MOLDINGS

Koji Shimizu, and Mitsuo Hamada, both of Chiba, Japan, assignors to Toray Silicone Company Ltd., Tokyo, Japan

Division of Ser. No. 215,133, Jul. 5, 1988, Pat. No. 4,911,974.
This application Mar. 15, 1990, Ser. No. 493,664
Claims priority, application Japan, Jul. 7, 1987, 62-168962
Int. Cl.[5] B05D *1/00*
U.S. Cl. 427—180 **2 Claims**

1. A method of making a tack-free silicone gel molding comprising the steps of:

(a) molding a crosslinked organopolysiloxane into a gel having a tacky surface and a partial three-dimensional network structure which exhibits limited fluidity and deformation upon the application of stress; and

(b) coating the gel of (a) with cured silicone rubber particles having an average diameter less than about 1 mm until the gel is tack-free.

4,985,278

COATING PROCESS

Eric R. George, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 17, 1989, Ser. No. 380,960
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—195 **7 Claims**

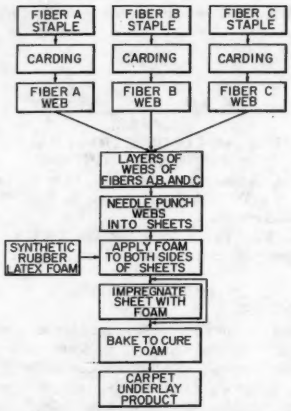
1. A process for coating a solid object with a polymeric material, which process comprises flame spraying a polymeric material provided as a powder having a particulate size from about 20 mesh to about 200 mesh, the polymeric material comprising a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, which linear alternating polymer has a limiting viscosity number from about 0.5 dl/g to about 10 dl/g as measured in m-cresol at 60° C., optionally uniformly mixed with up to about 35% by weight based on the total of a copolymer of ethylene and an α,β-ethylenically unsaturated carboxylic acid, by heating the polymeric material powder to substantially melt the polymeric material and thereafter propelling the substantially molten polymeric material onto the surface of the solid object to provide a first coating, thermally degrading at least the surface of the first coating and subsequently propelling additional substantially molten polymeric material onto the object to provide a second coating.

4,985,279

PROCESS FOR PREPARING CARPET UNDERLAY

Charles S. Mussallem, III, Jacksonville, Fla., assignor to No-Muv Corporation, Inc., Jacksonville, Fla.

Filed Jul. 26, 1989, Ser. No. 385,442
Int. Cl.[5] B05D *5/00*
U.S. Cl. 427—209 **20 Claims**



1. A process for preparing an improved carpet underlay which comprises the sequential steps of:

(a) separately carding one or more mixtures of different types of fiber to produce a plurality of webs;

(b) forming a composite web of alternate layers of said webs of the same or different mixtures of fibers;

(c) needle punching said composite web into a final compact sheet of a desired thickness;

(d) impregnating said final sheet from both sides with a rubber latex mixture;

(e) baking said impregnated sheet to cure said latex in situ; and

(f) recovering a carpet underlay.

4,985,280

PROCESS FOR HYDROPHOBIZATION OF MICROBACTERIA RETAINING AIR FILTER

Ralph-Peter Scholz, Lichtenberg, and Volker Glöckner, Oberbobritzsch, both of German Democratic Rep., assignors to VEB Kombinat Medizinund Labortechnik Leipzig, Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 103,981, Oct. 1, 1987, abandoned. This application May 22, 1989, Ser. No. 356,644
Claims priority, application German Democratic Rep., Dec. 22, 1986, 298191
Int. Cl.[5] B05D 5/00
U.S. Cl. 427—244 5 Claims

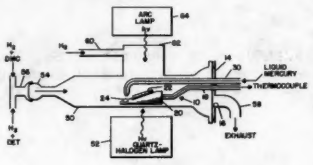
1. A process for hydrophobing air filter materials for retaining microbacteria, comprising applying to an air filter material selected from the group consisting of ceramics, textile fleece, glass fleece and nuclear track microfilter foil a hydrophobing composition consisting of at least one perfluorocarbon or a solution or suspension thereof, the composition containing no other active ingredient, said perfluorocarbon being a mixture of a perfluoroalkane and a perfluoroalkene.

4,985,281

ELEMENTAL MERCURY SOURCE FOR METAL-ORGANIC CHEMICAL VAPOR DEPOSITION

William L. Ahlgren, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Division of Ser. No. 234,722, Aug. 22, 1988, Pat. No. 4,901,670. This application Nov. 9, 1989, Ser. No. 434,652
Int. Cl.[5] C23C 16/00
U.S. Cl. 427—248.1 8 Claims



1. In a metal-organic chemical vapor deposition system having a reactor, a method of providing a source of elemental mercury for the growth of a mercury compound upon a substrate, comprising the steps of:

providing a substrate within the reactor, the substrate being disposed upon a heated substrate support;

providing a reservoir of elemental liquid mercury external to the reactor;

transporting elemental liquid mercury from the reservoir to the substrate support whereby the mercury is vaporized; and

directing the mercury vapor to flow over the substrate such that a saturated mercury atmosphere is maintained over a surface of the substrate.

4,985,282

PROCESS FOR PROTECTING AND CONSOLIDATING STONY MATERIALS

Giovanni Moggi; Desiderata Ingoglia, both of Milan, and Daria Lenti, Valenza, all of Italy, assignors to Ausimont S.r.l., Milan, Italy

Filed Dec. 18, 1989, Ser. No. 451,948
Claims priority, application Italy, Dec. 19, 1988, 23003 A/88
Int. Cl.[5] B65D 3/02
U.S. Cl. 427—393 4 Claims

1. A process for protecting marble, stones, tiles, cement, gypsum, or wood and other similar materials utilized in particular in the building sector, from the decay action caused by atmospheric agents and pollutants, comprising applying onto said materials a protective agent consisting of a mixture of:

(a) an aqueous dispersion of a vinylidene fluoride homo- or co-polymer comprising, by moles, from 55 to 100% of $CH_2{=}CF_2$, from 0 to 30% of C_2F_4 and from 0 to 45% of C_3F_6, and of:

(b) an aqueous emulsion or microemulsion of a perfluoropolyether consisting of sequences of fluorooxyalkylene units selected from the following:

$$(CF(CF_3)CF_2O),\ (CF_2CF_2O),\ (CF_2O)\ (CF(CF_3)O)\ (CF_2CF(CF_3)O),$$

$$(CF_2CF_2CF_2O),\ (CF_2CF_2CH_2O);$$

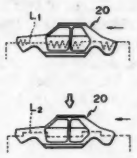
having an average molecular weight ranging from 1,000 to 10,000 and having perfluoroalkyl end groups and/or end groups containing functional groups capable of forming, with the material to be protected, physical or chemical bonds of the coordinative type or of the charge-transfer type.

4,985,283

METHOD AND DEVICE FOR PAINTING SIDE OUTER PANELS OF AN AUTOMOBILE BODY

Kentarou Ogata; Satoshi Kodama, and Masashi Murate, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 883,648, Jul. 9, 1986, abandoned. This application Sep. 27, 1989, Ser. No. 414,744
Claims priority, application Japan, Aug. 24, 1985, 60-185026
Int. Cl.[5] B05D 1/02
U.S. Cl. 427—424 5 Claims



1. A method for painting side outer panels of an automobile body conveyed along an assembly line, said automobile body having first outer panel portions which are situated over front and rear wheels of an automobile, and second outer panel portions which are not situated over said front and rear wheels, said side outer panels being sprayed with paint by spray heads located adjacent to said side outer panels and spraying paint onto said side outer panels, said method comprising the steps of:

first, spraying paint onto said first outer panel portions with said spray heads fixed at a point substantially midway between the top and bottom of said first outer panel portions, and spraying paint onto said second outer panel portions while said spray heads are moved up and down about a point substantially midway between the top and bottom of said second outer panel portions; and

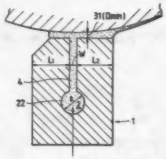
second, spraying paint uniformly onto said outer panels with said spray head located so as to maintain a substantially constant distance between said spray heads and said side outer panels while maintaining said spray heads vertically fixed when spraying said second outer panel portions, said second spraying step being carried out after said first spraying step, whereby the automobile body is painted in a compact space with a paint coating having both high reflectivity and good smoothness as compared to a paint coating produced by the first spraying step along.

4,985,284

COATING METHOD

Norio Shibata, and Sato Tsunehiko, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 7, 1989, Ser. No. 390,015
Claims priority, application Japan, Aug. 19, 1988, 63-204806
Int. Cl.[5] B05D *1/28*
U.S. Cl. 427—428 4 Claims



1. A coating method in which a desired coating solution is supplied to an extrusion-type coating head by coating solution supplying means, and the coating solution is applied with the extrusion-type coating head directly or through a coating roll to a support being run, wherein the improvement comprises:

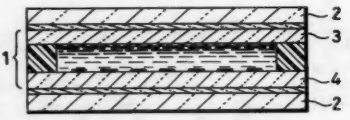
providing at one end of said coating solution supplying means a filtering element disposed at or near a coating solution supplying inlet of said extrusion-type coating head, said filtering element having openings whose diameter is smaller than a coating clearance between a doctor edge of said extrusion-type coating head and said support or said coating roller, and supplying said coating solution to said extrusion-type coating head after being filtered by said filtering element.

4,985,285

LIQUID CRYSTAL DISPLAY PANEL INCORPORATING AN OPTICAL PHASE SHIFTING SUBSTRATE

Rinjiro Ichikawa, and Kenji Hashimoto, both of Tokyo, Japan, assignors to Fujimori Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1989, Ser. No. 343,304
Int. Cl.[5] G02F *1/13, 1/23*
U.S. Cl. 428—1 1 Claim



1. A liquid crystal display panel incorporating an optical phase shifting substrate comprising:

a liquid crystal cell formed of a first and second substrate having a super-twisted nematic liquid crystal sealed therebetween, each of said substrates supporting a transparent electrode;

said first substrate being an optical phase shifting substrate having a retardation value of not less than 60 nm comprising either an oriented synthetic resin optical phase shifting film A or a laminate film consisting of said oriented synthetic resin film A and an optically isotropic amorphous film B disposed on at least one side thereof;

said second substrate being an optically isotropic substrate comprising a single-layer or multiple-layer optically isotropic amorphous film having a retardation value of not more than 50 nm, or a glass sheet; and

a pair of polarizing sheets disposed, respectively, on each side of said liquid crystal cell.

4,985,286

ABRASION-CONCEALING AGENT FOR GLASS CONTAINERS, ABRASION-CONCEALED GLASS CONTAINER, AND METHOD FOR CONCEALING ABRASIONS ON GLASS CONTAINER

Akitsugu Kurita; Yoshiaki Takezawa; Nobuhiro Saitoh; Takehisa Shimada, and Hideaki Takemoto, all of Tokyo, Japan, assignors to Toshiba Silicone Co. Ltd. and Asahi Breweries, Ltd., both of Tokyo, Japan

Filed Apr. 27, 1990, Ser. No. 515,306
Claims priority, application Japan, Apr. 27, 1989, 1-108873; Feb. 28, 1990, 2-48389
Int. Cl.[5] C09D *183/04;* A47G *19/22*
U.S. Cl. 428—34.7 15 Claims

1. An abrasion-concealing agent for glass containers, which comprises:

(A) 100 parts by weight of a polyorganosiloxane represented by the formula:

$$(R^1)_a(CH_3)_bSiX_cO_{\frac{4-(a+b+c)}{2}}$$

wherein R^1 represents a substituted or unsubstituted monovalent hydrocarbon group or hydrogen atom, X which may be the same or different each represents hydroxyl group or a hydrolyzable group, and a, b, and c each is a number satisfying the following equations, provided that a may be 0:

$$0.8<a+b<2$$

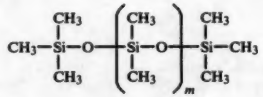
$$b/a>10 \text{ (in the case of } a\neq 0)$$

$$0.3\leqq c\leqq 2$$

and

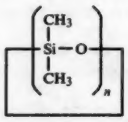
(B) 100 to 1,000 parts by weight of a volatile polydimethylsiloxane represented by the formula (I) the formula (II) or mixtures of the formula (I) and the formula (II):

(I)



wherein m is 0 or an integer of 1 to 9,

(II)



wherein n is an integer of 3 to 8, the agent having a viscosity as measured at 25° C. of 2 to 10,000 cSt.

4,985,287

LIGHT-STABILIZED, VINYL CHLORIDE RESIN BODY

Masao Tachibana, Koshigaya, Japan, assignor to Somar Corporation, Japan

Filed Jun. 23, 1989, Ser. No. 369,996
Claims priority, application Japan, Jun. 27, 1988, 63-158406
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—34.5 10 Claims

1. A plastic article comprising a shaped body of a vinyl chloride resin, and finely divided particles of a metal oxide capable of screening ultraviolet rays and dispersed in said shaped body, each of said particles being coated with a layer of

an anionic surfactant, said particles coated with surfactant being present in said article in the amount of 0.1–10% by weight, based on the weight of said vinyl chloride resin.

4,985,288

RESONANT FREQUENCY CHARACTERISTIC TAG AND METHOD OF MANUFACTURING THE SAME

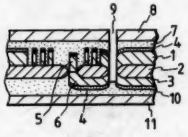
Takeshi Matsumoto, Kohza; Yuji Suzuki, Chigasaki; Masahiro Kumagai, Yokohama, and Shinya Uchibori, Hiroshima, all of Japan, assignors to Tokai Metals Co., Ltd., Japan

Filed Apr. 27, 1989, Ser. No. 343,747

Claims priority, application Japan, Apr. 30, 1988, 63-107952; Aug. 8, 1988, 63-197769

Int. Cl.[5] B32B *3/00*

U.S. Cl. 428—40 29 Claims



1. A resonant frequency characteristic tag comprising:

a thin dielectric film comprising a polymer,

a pair of resonant frequency characteristic circuits each formed on a respective side of said thin dielectric film, made of a metal foil and having a particular resonant frequency, said two resonant frequency characteristic circuits having terminal sections short-circuited to one another,

a release paper applied by a pressure sensitive adhesive to the surface of one of said two resonant frequency characteristic circuits, and

a through hole with a diameter in a range between 0.5 mm and 3 mm being formed through an electrode plate in a capacitor section in the surface of said one circuit to which said release paper is applied such that it reaches an electrode plate in a capacitor section in the surface of the other circuit, the distance between said two electrode plates being thus adjusted to a predetermined distance of 0.0003 mm or less at a portion at the periphery of said through hole.

4,985,289

OPTICAL DATA RECORDING MEDIUM

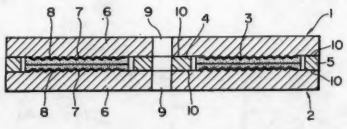
Hisamitsu Kamezaki, Ibaraki, and Yoshitane Tuburaya, Toride, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed May 12, 1989, Ser. No. 351,087

Claims priority, application Japan, May 14, 1988, 63-115979

Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—64 13 Claims



1. An optical data recording medium comprising:

first transparent substrate having a first recording layer formed of a melting and diffusion type recording mode material;

second transparent plate shaped substrate, with or without a second recording layer, integrally bonded to said first transparent substrate with said first recording layer facing inward; and

a first porous protective layer composed of a porous material which is wet resistant and has a low surface energy and large tangent angle, interposed between said first recording layer of said first transparent substrate and said second recording layer or surface of said second transparent substrate.

4,985,290

PROTECTIVE COATINGS FOR POLYACETYLENIC RECORDING MEDIA

David F. Lewis, Monroe, Conn.; Robert D. Schenfele, Caldwell, and Thomas Winkler, Maywood, both of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Division of Ser. No. 258,523, Oct. 17, 1988, Pat. No. 4,952,244. This application Feb. 16, 1990, Ser. No. 481,036

Int. Cl.[5] B32B *3/00*

U.S. Cl. 428—76 16 Claims

1. A dry imageable polyacetylenic film recording medium having an imageable polyacetylenic layer coated with a dry mixture comprising a binder compatible with said imageable layer and an effective light stabilizing amount of ascorbic acid in a mole ratio of between about 1:1 and about 10:1, binder to acid.

4,985,291

BURNER SKELETON

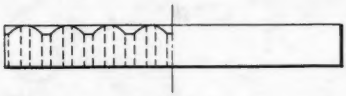
Atsushi Nishino, Neyagawa; Kunio Kimura, Hirakata; Yasuhiro Takeuchi, Hirakata, and Koji Ishihara, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 578,756, Feb. 9, 1984, Pat. No. 4,595,664. This application Apr. 2, 1986, Ser. No. 847,199

Claims priority, application Japan, Feb. 16, 1983, 58-24990; Jul. 18, 1983, 58-131239

Int. Cl.[5] B01D *39/20*

U.S. Cl. 428—116 10 Claims



1. A burner skeleton having a porous honeycomb structure including a plurality of through-holes spaced from each other by a wall thickness not exceeding 1 mm, said burner skeleton molded from a composition comprising calcium aluminate and a silica compound, said calcium aluminate containing 15 to 40 weight % of lime, 35 to 80 weight % of alumina and 0.3 to 20 weight % of iron oxide, said molded composition comprising an inorganic hardened surface layer formed on one surface of the molding.

4,985,292

THERMAL TRANSFER TYPE RECORDING SHEET

Shigeki Umise, Kawaguchi, and Hirokatsu Imamura, Nerima, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00189, § 371 Date Oct. 19, 1988, § 102(e) Date Oct. 19, 1988, PCT Pub. No. WO88/06101, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 23, 1988, Ser. No. 265,679

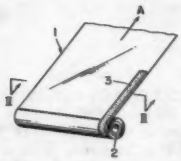
Claims priority, application Japan, Sep. 26, 1987, 62-239939; Feb. 23, 1988, 62-25204

Int. Cl.[5] B41M *5/26*

U.S. Cl. 428—194 7 Claims

1. A thermal transfer type recording sheet in the form of a continuous strip to be rolled up on a roll shaft, comprising a base film with a hot melt ink layer formed on either side thereof, and an end mark formed in a preassigned position on

either side of the recording sheet adjacent one end thereof so as to be optically detected for warning the user of the fact that the recording sheet is being used up, the end mark being in the form of a light-reflective layer printed by gravure printing



with a silvercolored gravure printing ink containing finely divided aluminum, said light-reflective layer consisting of a plurality of minute dots of said printing ink applied to the strip in a mutually adjoining or contiguous arrangement.

4,985,293

POLYMER BLEND FOR MOLDED CIRCUIT BOARDS AND OTHER SELECTIVELY CONDUCTIVE MOLDED DEVICES

Gerald T. Keep, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 14, 1989, Ser. No. 393,426
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 18 Claims

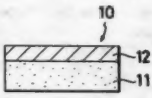
1. A selectively conductive molded article, comprising a blend containing about 1 to about 99 wt% of an amorphous thermoplastic polymer and about 99 to about 1 wt% of a semicrystalline thermoplastic polymer.

4,985,294

PRINTED WIRING BOARD

Hideo Watanabe, Kanagawa; Hajime Yamazaki, Hadano, and Hiroyuki Wakamatsu, Kawasaki, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Minato-ky, Japan

Filed Aug. 24, 1989, Ser. No. 397,790
Claims priority, application Japan, Aug. 25, 1988, 63-209341; Aug. 25, 1988, 63-209342
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 11 Claims



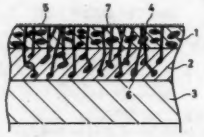
1. A composite film for use in printed wiring boards which comprises an insulating layer and a copper foil laminated thereon in direct contact with said insulating layer, the insulating layer comprising a blend of an epoxy resin and an acrylonitrile-butadiene rubber, the weight ratio of epoxy resin to acrylonitrile-butadiene rubber being in the range of from 30:70 to 90:10.

4,985,295

MAGNETIC RECORDING MEDIUM AND METHOD FOR PRODUCING THE SAME

Heigo Ishihara, Tokyo; Akira Osaki, Hachiouji; Waichi Nagashiro, Kanagawa, and Fuzio Maeda, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 7, 1988, Ser. No. 141,423
Claims priority, application Japan, Jan. 23, 1987, 62-12356; Feb. 5, 1987, 62-23606
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—213 10 Claims



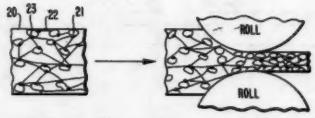
1. A magnetic recording medium comprising a substrate and a magnetic layer formed thereon which contains magnetic particles bonded to each other with a first binder containing a thermosetting resin and has a number of first fine pores impregnated with a lubricant, wherein an undercoating layer comprising a second binder containing at least one resin selected from the group consisting of a thermosetting resin, an ultraviolet-curable resin, and an electron beam-curable resin is interposed between said substrate and said magnetic layer, and said undercoating layer has a number of second fine pores which communicate with said first fine pores so that they reach the surface of said magnetic layer and is impregnated with a lubricant and wherein said first fine pores have a diameter of 0.2 μm or less and a rate of the fine pore in area of the magnetic layer of 3 to 30% and said second fine pores have a diameter of 5 μm or less and a rate of fine pore in area of the undercoating layer of 5 to 60%, said rate of the fine pore in area representing the total area of the fine pores per unit area in percentage.

4,985,296

POLYTETRAFLUOROETHYLENE FILM

William P. Mortimer, Jr., New Castle, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Mar. 16, 1989, Ser. No. 324,166
Int. Cl.[5] B32B *27/32;* B20C *67/20;* D02J *1/06*
U.S. Cl. 428—220 16 Claims



1. A thin film of filled polytetrafluoroethylene that:
(a) contains 25–85 volume percent particulate filler,
(b) has a film thickness of between 0.1 and 5 mil, and
(c) is substantially free of visual pinholes.

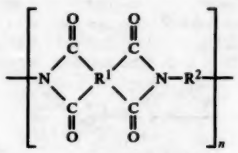
4,985,297

COMPOSITE MATERIALS

Shinji Tamaru, Suita; Motonobu Kubo, Toyonaka; Osamu Tanaka, Suita, and Tsutomu Kobayashi, Settsu, all of Japan, assignors to Daikin Industries, Inc., Osaka, Japan

Filed Apr. 28, 1989, Ser. No. 344,866
Claims priority, application Japan, Apr. 30, 1988, 63-108042; May 6, 1988, 63-111168
Int. Cl.[5] D03D *25/00*; B32B *15/08*; D04H *1/00*
U.S. Cl. 428—260 14 Claims

1. A composite sheet consisting essentially of a fluorohydrocarbon polymer substrate impregnated with a fluorine-containing polyimide represented by the formula (2).



(2)

wherein R^1 is a residue obtained by removing two acid anhydride groups from an aromatic tetracarboxylic dianhydride, R_2 is a residue obtained by removing two amino groups from an aromatic diamine, at least one of R_1 and R_2 containing in the main chain a group represented by:

wherein X is $-(CH_2)pRf'$

Rf' is C_{1-20} perhaloalkyl,

p is 0 or an integer of 1 to 3,

Y is the same as X, a hydrogen atom, C_{1-8} alkyl or C_1 haloalkyl, and

n is an integer of 1 to 2,000.

2. A composite sheet as defined in claim 1, wherein the fluorohydrocarbon polymer substrate is a porous film or sheet, fiber fabric or nonwoven fabric of a fluorohydrocarbon polymer.

4,985,298

ABSORBENT NONWOVEN WEBS

Lee A. Buckley, White Bear Lake, and Thomas I. Insley, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 235,691, Aug. 18, 1988, abandoned, which is a continuation of Ser. No. 687,828, Dec. 3, 1984, abandoned. This application Oct. 2, 1989, Ser. No. 418,698
Int. Cl.[5] A61F *13/20, 13/36*; B32B *27/04, 27/26*
U.S. Cl. 428—288 9 Claims

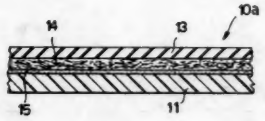
1. An absorbent porous web comprising a nonwoven fibrous three dimensional network of staple fibers, said fibers having a thin but continuous in situ cured coating of a super-absorbent polymeric sorbent thereon, said fibrous network being unified by said polymeric coating essentially only at the crossing points of said fibers such that said polymeric coating is not readily discernible within the interstices of the web even upon microscopic examination thereof, said polymeric coating, upon sorption of liquid, swelling with minimum occlusion of the interstices of the web.

4,985,299

STRATIFORM PRODUCT IN SHEET FORM FOR PACKAGING PURPOSES

Piero R. Clerici, Piazza S. Ambrogio, 12, Milan, Italy

Filed Mar. 16, 1990, Ser. No. 495,170
Claims priority, application Italy, Mar. 20, 1989, 19828 A/89
Int. Cl.[5] B32B *27/08*
U.S. Cl. 428—314.4 11 Claims



1. Stratiform product in sheet form for packaging purposes characterized in that it comprises at least one impact-resistant film and a layer constituted by an elastomeric mass endowed with properties of selective and repetitive adhesion, with said film and said layer being united to each other by means of an inseparable bond.

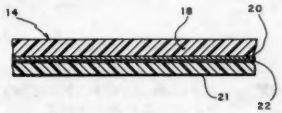
3. Packaging product according to claim 1, characterized in that the impact-resistant film is made from closed-cell foamed polyethylene, from polyurethane foam or from bubble-polyethylene.

4,985,300

SHRINKABLE, CONFORMABLE MICROWAVE WRAP

Hua-Feng Huang, Mendenhall, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 28, 1988, Ser. No. 291,213
Int. Cl.[5] B32B *15/08, 27/32, 27/36*
U.S. Cl. 428—332 15 Claims



1. A heat shrinkable film useful for packaging and for cooking in a microwave oven of at least one food item which requires surface browning or crisping, comprising

(a) at least one layer of flexible, heat resistant, microwave transparent base film which exhibits shrinkage of at least about 10% when heated unrestrained to 100° C. for 5 seconds, and

(b) at least one partially transmissive layer of microwave susceptor material extending over at least a portion of the base film and present in an amount sufficient to cause the film to heat under microwave cooking conditions to a temperature suitable for browning or crisping of a food item placed adjacent thereto.

5. The heat shrinkable film of claim 1 wherein the susceptor material is a substantially continuous layer of metal of appropriate thickness to cause the film to heat.

7. The heat shrinkable film of claim 5 wherein the thickness of the layer of metal is sufficient to provide a resistivity of about 60 to about 1000 ohms/square.

4,985,301

ASSEMBLY FOR USE IN MAKING A PRINTING PLATE

Alan Butters, Suffolk, and Roger N. Barker, Essex, both of England, assignors to Imperial Chemical Industries, plc, London, England

Filed Jul. 29, 1983, Ser. No. 518,757

Claims priority, application United Kingdom, Aug. 11, 1982, 8223138

Int. Cl.[5] B32B *27/30, 27/08;* G03C *1/80;* B41N *1/12*

U.S. Cl. 428—336 4 Claims

1. An assembly adapted to receive a photopolymerizable material in the production of a relief printing plate which comprises (a) a polymeric substrate, (b) a priming layer on the substrate and (c) a resin layer on the priming layer, wherein the resin layer is at least 2 microns thick and comprises a terpolymer resin of average molecular weight in the range 1,000 to 100,000 and which contains 75 to 85 weight % vinyl chloride, 2 to 8 weight % vinyl acetate and the balance of an unsaturated termonomer.

2. An assembly adapted to receive a photopolymerizable material in the production of a relief printing plate which comprises

(a) a polymeric substrate,

(b) a priming layer on the substrate, and

(c) a resin layer on the priming layer, wherein the resin layer is at least 2 microns thick and comprises a terpolymer resin of average molecular weight in the range 1,000 to 100,000 and which contains 60 to 98 wt% vinyl chloride, 2 to 20 wt% vinyl acetate and up to 20 wt% of a termonomer which is a hydroxyl-containing alkyl acrylate or a methacrylate where the alkyl group contains 1 to 6 carbons.

4,985,302

REMOVABLE SELF-ADHESIVE SHEET WITH WRITABLE SURFACE

Guido Sala, Milan, and Ivano Zucchiatti, Arese, both of Italy, assignors to Incas International Carbon Solvent S.p.A., Italy

Filed Jun. 3, 1988, Ser. No. 202,960

Claims priority, application Italy, Feb. 8, 1988, 20608/88[U]

Int. Cl.[5] B32B *7/12, 15/04*

U.S. Cl. 428—343 16 Claims

1. A removable self-adhesive sheet with a writable surface comprising a support consisting of a polymer film, wherein the support has a first face at least partially covered with an adhesive having a low adhesiveness value, a second face, and an ink applied on said second face, said ink having the following chemical composition:

pigment	30 to 37% by weight,
vinyl or acrylic resin	9 to 15% by weight,
synthetic wax	0.3 to 1% by weight,
epoxide stabilizer	0.4% by weight,
phthalic acid esters	4 to 5% by weight,
ethyl acetate	38 to 55% by weight, and
ethanol	9 to 11% by weight.

4,985,303

PROCESS FOR PREPARING HEAT-INSULATING STRUCTURAL ELEMENTS, AND PRODUCTS OBTAINED THEREBY

Antonio Addeo, Napoli; Alberto Bonvini, Milan; Romano Reggiani, Mantova, and Annibale Vezzoli, Como, all of Italy, assignors to Centro Sviluppo Settori Impiego S.r.l., Milan, Italy

Filed Jul. 24, 1990, Ser. No. 556,440

Claims priority, application Italy, Jul. 26, 1989, 21336 A/89

Int. Cl.[5] B32B *3/26*

U.S. Cl. 428—36.5 11 Claims

10. Heat insulating, structural elements comprising a first half-shell, a heat-insulating layer constituted by a layer of beads made from a foamed or semi-foamed thermoplastic polymer sintered on said first half-shell, and such as to reproduce the shape thereof, and a second half-shell acting as a sealing element, capable of fitting the shape of the sintered layer.

4,985,304

COATED LARGE DIAMETER ORIENTED MONOFILAMENTS

Teh-Chuan Wang, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 212,299, Jun. 27, 1988, Pat. No. 4,894,195, which is a continuation-in-part of Ser. No. 18,385, Feb. 25, 1987, Pat. No. 4,839,132. This application Dec. 22, 1989, Ser. No. 455,223

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—373 11 Claims

1. A monofilament prepared from at least one semi-crystalline linear polymer and having a diameter of at least about 60 mils, the monofilament being oriented at least about 3.5 times in the longitudinal direction, having a variation in ovality of less than about 5%, having at least 2 substantially concentric inner layers, and having at least one outer layer of at least about 10 mils of substantially unoriented polymeric material.

4,985,305

PROCESS FOR THE PREPARATION OF RUBBER/METAL COMPOSITE MATERIALS WITH A POWERFUL RUBBER/METAL BOND

Rüdiger Schubart, Bergisch Gladbach; Manfred Pieroth, and Theo Kempermann, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 312,690

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1988, 3807096

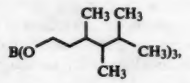
Int. Cl.[5] C08K *5/55*

U.S. Cl. 428—389 7 Claims

1. A process for the preparation of a composite material based on vulcanized rubber and containing metal, in which the rubber is vulcanized in the presence of the metal and a bonding agent, characterized in that the bonding agent used comprises

I. from 0.01 to 0.4% by weight of cobalt in the form of cobalt salts of linear, branched or cyclic saturated or unsaturated carboxylic acids having 2 to 24 carbon atoms and 1 to 4 carboxyl groups per molecule and

II. from 0.1 to 6% by weight of boric acid ester, based in each case on the rubber, wherein the boric acid ester is



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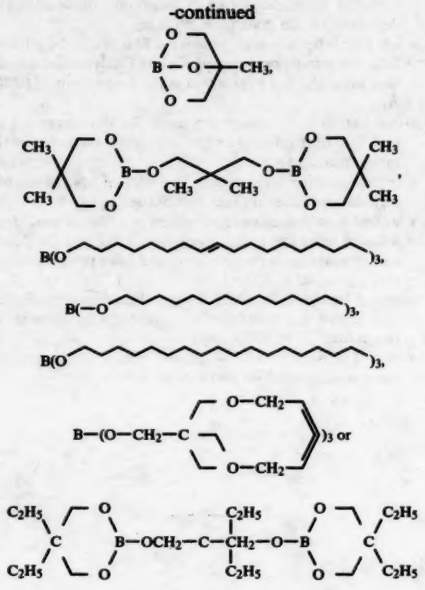


and wherein said rubber is a natural rubber, polychloroprene, ethylene/vinyl acetate copolymer, polybutadiene, styrene/-butadiene copolymer, acrylonitrile/butadiene copolymer or a partially hydrogenated product thereof or a mixture thereof.

4,985,306

BASE PLATE FOR RECORDING DISC AND A METHOD FOR ITS MANUFACTURE

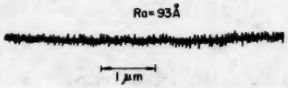
Toshinori Morizane, 26-12, Hazawa 2-chome, Nerima-ku, Tokyo, and Tadao Tokushima, 18-1, Izumi 1-chome, Hamamatsu-shi, Shizuoka-ken, both of Japan

Filed Jan. 9, 1990, Ser. No. 462,381

Claims priority, application Japan, Feb. 16, 1989, 1-37060

Int. Cl.[5] B44C *1/22*; C03C *15/00, 25/06*; B32B *17/00*

U.S. Cl. 428—410 **6 Claims**



2. A base plate for a recording disc obtained by the method of subjecting a base plate containing therein SiO_2-Li_2O-Al_2O_3 series crystallized glass to crystallizing treatment; polishing the surface of said base plate; thereafter subjecting said base plate to etching treatment with use of etchants having different rates of etching between the crystallized layer and the amorphous layer.

4,985,307

FLAME RETARDANT FOR WOOD AND FLAME RESISTANT WOOD

Nobuo Kobayashi, Tokyo; Hisaomi Yamamoto, Chiba, and Kiyoshi Umehara, Osaka, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

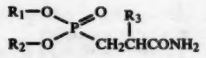
Filed Oct. 27, 1988, Ser. No. 263,308

Claims priority, application Japan, Oct. 28, 1987, 62-272089

Int. Cl.[5] B32B *27/38, 29/00*; B27N *9/00*; C09K *21/00*

U.S. Cl. 428—413 **3 Claims**

1. A flame resistant wood product coated with a flame retardant composition which comprises at least one compound selected from 3-(dialkylphosphono)propionamides and methylolated derivatives thereof represented by the following general formula:



(I)

wherein R_1 and R_2 each represents an alkyl group containing 1 to 3 carbon atoms; and R_3 represents a hydrogen atom, a methyl group or a methylol group; at least one resin selected from the group consisting of water-soluble or water-dispersible resins, melamines and copolycondensated urea melamine resins; and ammonium polyphosphates microcapsulated by melamine or epoxy resins.

4,985,308

AMORPHOUS COPOLYMERS OF PERFLUORO-2,2-DIMETHYL-1,3-DIOXOLE

Edward N. Squire, Spring Hill, Fla., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 458,012, Dec. 28, 1989, which is a division of Ser. No. 148,579, Jan. 26, 1988, which is a division of Ser. No. 904,095, Sep. 4, 1986, Pat. No. 4,754,009, which is a continuation-in-part of Ser. No. 723,649, Apr. 16, 1985, abandoned, which is a division of Ser. No. 591,486, Mar. 20, 1984, Pat. No. 4,530,569, which is a continuation-in-part of Ser. No. 294,789, Aug. 20, 1981, abandoned. This application Apr. 9, 1990, Ser. No. 509,410

Int. Cl.[5] B32B *27/00, 15/08*

U.S. Cl. 428—422 **1 Claim**

1. A metallic sheet or foil having on at least one face thereof a coating of an amorphous dipolymer of 65–99 mole % of perfluoro-2,2-dimethyl-1,3-dioxole with a complementary amount of tetraflrouroethylene, the glass transition temperature of the dipolymer being at least 140° C.

4,985,309

ALLOYED STEEL POWDER FOR POWDER METALLURGY

Kuniaki Ogura; Junichi Oota; Teruyoshi Abe, and Shigeaki Takajo, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Aug. 1, 1988, Ser. No. 226,478

Claims priority, application Japan, Aug. 1, 1987, 62-193400

Int. Cl.[5] B22F *1/02*

U.S. Cl. 428—570 **2 Claims**

1. An alloyed steel composite powder for powder metallurgy, having a diffused coating layer of at least one element selected from nickel, copper, molybdenum and tungsten, said diffused coating layer being partially diffused and adhered in a powder form to the surfaces of prealloyed steel powder particles containing chromium, the contents of said particles being in the following ranges:

Cr: 0.1–5.0 wt. %
Ni: 0.1–10.0 wt. %
Cu: 0.1–10.0 wt. %
Mo: 0.1–5.0 wt. %
W: 0.1–5.0 wt. %

with the limitation that Ni+Cu+Mo+W is not more than

10.0 wt. %, and the balance comprising not more than 0.20 wt. % of oxygen and a substantial amount of iron.

4,985,310

MULTILAYERED METALLURGICAL STRUCTURE FOR AN ELECTRONIC COMPONENT

Birendra N. Agarwala, Wappingers Falls; Keith F. Beckman, Wallkill; Alice H. Cooper-Joselow, Pleasantville; Chandrasekhar Narayan, Beacon; Sampath Purushothaman, Yorktown Heights, and Sudipta K. Ray, Wappingers Falls, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 179,330, Apr. 8, 1988, abandoned. This application Sep. 5, 1989, Ser. No. 405,418

Int. Cl.[5] H01L *29/14*

U.S. Cl. 428—620 **16 Claims**

11. A solder-contacted multilayered metallurgical structure for an electronic component comprising:

(a) a base metallurgy layer comprising a layer selected from the group consisting of titanium and chromium and then a layer of copper;

(b) a layer of cobalt directly on said layer of copper; and

(c) a layer of noble or relatively noble metal directly on said layer of cobalt;

(d) a quantity of solder in contact with said layer of noble or relatively noble metal.

4,985,311

ZN-NI BASED COMPOSITE ELECTROPLATED STEEL SHEET AND MULTI-LAYER COMPOSITE PLATED STEEL SHEET

Yoshio Shindou, and Fumio Yamazaki, both of Kimitsu, Japan, assignors to Nippon Steel Corporation, Japan

Continuation-in-part of Ser. No. 272,846, Nov. 18, 1988, abandoned. This application Sep. 11, 1989, Ser. No. 404,986

Int. Cl.[5] B21D *39/00*

U.S. Cl. 428—623 **15 Claims**

1. A Zn—Ni based composite plated steel sheet excellent in corrosion resistance and workability which comprises a ferrous substrate and, provided thereon, a Zn—Ni based composite electroplated layer comprising 1–15% by weight of Ni, 0.1–10% by weight of Cr 0.1–10% by weight of SiO_2, having a particle size of 1 to smaller than 100 mμ 0.01–3% by weight of Fe and the balance of said layer being essentially Zn.

4,985,312

HEAT REFLECTING GLASS PLATE WITH MULTILAYER COATING

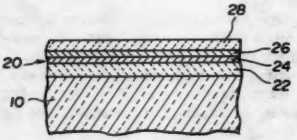
Koichi Furuya; Hiroshi Nakashima; Yasunobu Iida, all of Matsusaka; Nobuyuki Takeuchi, Ise, and Masato Nakamura, Mie, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Dec. 1, 1989, Ser. No. 444,717

Claims priority, application Japan, Dec. 13, 1988, 63-314716

Int. Cl.[5] B32B *17/06*

U.S. Cl. 428—627 **11 Claims**



1. A heat reflecting glass plate, comprising a transparent glass plate and a multilayer coating formed on one side of the glass plate, the multilayer coating comprising:

a base layer which is a film of a protective material selected from the group consisting of indium-tin oxide and AlN deposited on the glass plate surface;

a first heat reflective layer which is a film of a metal selected from the group consisting of Ag and Cu deposited on said base layer and has a thickness in the range from 40 to 200 Å;

a first barrier layer which is a metal Zn film deposited on said first heat reflective layer and has a thickness in the range from 20 to 200 Å;

a first protective layer which is a film of said protective material deposited on said first barrier layer;

a second heat reflective layer which is a film of said metal selected from the group consisting of Ag and Cu deposited on said first protective layer and has a thickness in the range from 40 to 200 Å;

a second barrier layer which is a metal Zn film deposited on said second heat reflective layer and has a thickness in the range from 20 to 200 Å; and

a second protective layer which is a film of said protective material deposited on said second barrier layer.

4,985,313

WIRE AND CABLE

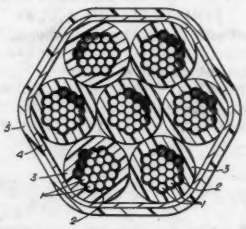
Richard J. Penneck, Lechlade; James M. O'Brien; Stephen J. Duckworth, both of Swindon, and Nicholas J. G. Smith, Swindon, all of England, assignors to Raychem Limited, Swindon, England

Continuation-in-part of Ser. No. 711,537, Mar. 7, 1985, abandoned. This application Jan. 14, 1986, Ser. No. 818,854

Claims priority, application United Kingdom, Jan. 14, 1985, 8500816; Jan. 14, 1985, 8500817; Jan. 14, 1985, 8500818; Jan. 14, 1985, 8500819; Jan. 30, 1985, 8502316

Int. Cl.[5] H01B *7/18*

U.S. Cl. 428—627 **3 Claims**



1. A metallic conductor which comprises a bundle of metallic copper strands which are individually provided with an intermediate layer formed of a metal that acts as a barrier to diffusion of oxygen or copper or both extending around them, the bundle having an adherent electrically insulating refractory coating which extends around the circumference of the bundle but not around the individual strands and an additional metallic layer between the intermediate layer and the refractory coating which also extends around the circumference of the bundle but not around the individual strands.

4,985,314

NOVEL VINYL CHLORIDE RESINS AND COMPOSITIONS INCORPORATING SUCH RESINS

Charles N. Merriam, Martinsville; Charles B. Mallon, Belle Mead; James R. Harvey, Bridgewater, and Robert N. Johnson, Basking Ridge, all of N.J., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Continuation of Ser. No. 787,121, Oct. 15, 1985, abandoned.
This application Jun. 21, 1989, Ser. No. 368,891
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—694 17 Claims

1. A vinyl chloride polymer suitable for use as a binder resin for particulate material consisting essentially of:

(a) vinyl chloride in an amount of about 70 to about 90 percent by weight;

(b) hydroxyalkyl acrylate in an amount to provide about 0.5 to about 3 percent by weight hydroxyl groups;

(c) an epoxy containing vinyl monomer in an amount to provide about 0.1 to about 1.5 percent by weight oxirane oxygen;

(d)(i) acrylic acid, methacrylic acid, itaconic acid, fumaric acid or maleic acid; or

(ii) a phosphorus compound providing a phosphorus ester moiety characterized by the formula:

wherein R is hydrogen, alkyl or alkenyl having from 1 to 20 carbon atoms, an alkyl acrylate or methacrylate moiety having from 2 to 10 carbon atoms in the alkyl segment, a substituted or unsubstituted phenyl and mixtures thereof, component (i) when present, being in an amount sufficient to provide about 0.2 to about 1.5 percent by weight carboxyl groups and component (ii) when present, being in an amount sufficient to provide about 0.03 to about 1 percent by weight phosphorus.

4,985,315

MATERIAL FOR THE CONDUCTION OF PROTONS AND METHOD OF MAKING THE SAME

Joseph Lemoine, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Nov. 6, 1989, Ser. No. 432,378
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1988, 3837814
Int. Cl.[5] H01M *10/39*
U.S. Cl. 429—33 23 Claims

10. A process for producing a proton conducting material of an amorphous structure on a substrate comprising the steps of:

(a) preparing a suspension made of a potassium silicate solution and a finely distributed powder having a composition relative to about one mol of potassium hydrodisilicate of about 0 to 5 mols of one of oxometallate and oxometallate forming agents, about 0 to 0.5 mols of a trivalent metal ion in one of an oxidic bond and as an anion of a salt with approximately a same ionic radius as a silicon ion, about 0 to 0.5 mols of a bivalent metal ion as one of an oxide, hydroxide and anion of a salt with an approximately identical ionic radius as a potassium ion; and about 0 to 4 mols silicon dioxide, in which case a lower limit with two constituents can be 0;

(b) applying the suspension to a substrate;

(c) heating the suspension and the substrate under high pressure to temperatures between about 500° and about 800° C. at a pressure of from about 20 to about 400 bar to form a proton conducting glass layer with a substrate.

4,985,316

CORROSION RESISTANT FUEL CELL SUBSTRATES

Sudhangshu Bose, and Michael E. Gorman, both of Manchester, Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Continuation of Ser. No. 155,185, Feb. 12, 1988, abandoned.
This application Nov. 3, 1989, Ser. No. 432,335
Int. Cl.[5] H01M *4/96*
U.S. Cl. 429—44 3 Claims

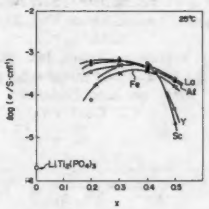
1. A fuel cell electrode assembly substrate consisting essentially of a mat of graphitized carbon fibers with substantially-completely all of the fibers in the mat being uniformly coated with a binder and graphitized to form a glassy carbon coating which is highly resistant to corrosion, said graphitized binder covering substantially all of the inner fiber junctions interstitial surfaces in the mat to bind the fibers together.

4,985,317

LITHIUM ION-CONDUCTIVE SOLID ELECTROLYTE CONTAINING LITHIUM TITANIUM PHOSPHATE

Ginya Adachi, Kobe; Nobuhito Imanaka, Toyonaka; Hiromichi Aono, Niihama; Eisuke Sugimoto, Niihama; Yoshihiko Sadaoka, Matsuyama; Naoshi Yasuda, Yokohama; Takeo Hara, Yokohama, and Masaki Nagata, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1989, Ser. No. 372,075
Claims priority, application Japan, Nov. 30, 1988, 63-302539; Nov. 30, 1988, 63-302540; Dec. 14, 1988, 63-315800; Mar. 9, 1989, 1-57367
Int. Cl.[5] H01M *6/18*
U.S. Cl. 429—191 6 Claims



1. A lithium ion-conductive solid electrolyte selected from the group consisting of:

a compound represented by the chemical formula, $Li_{1+x}M_xTi_{2-x}(PO_4)_3$, wherein M is at least one element selected from the subgroup consisting of Fe, Al Sc, Y, La and the rare earth elements, and wherein x is a number from 0.1 to 1.9;

a compound represented by the chemical formula, $Li_{1+y}Ti_2Si_yP_{3-y}O_{12}$, wherein y is a number from 0.1 to 2.9; and

a compound obtained by mixing a compound represented by the chemical formula, $LiTi_2(PO_4)_3$ with a lithium compound other than $LiTi_2(PO_4)_3$, and sintering the resulting mixture.

4,985,318

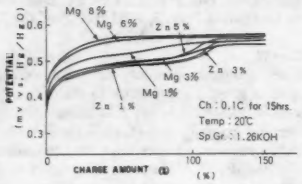
ALKALINE BATTERY WITH A NICKEL ELECTRODE

Masahiko Oshitani; Keiichi Hasegawa, and Hiroshi Yufu, all of Takatsuki, Japan, assignors to Yuasa Battery Co., Ltd., Takatsuki, Japan

Filed May 30, 1989, Ser. No. 358,118
Claims priority, application Japan, Jul. 19, 1988, 63-180047; Oct. 18, 1988, 63-262047
Int. Cl.[5] H02M *4/32*
U.S. Cl. 429—223 7 Claims

1. Active material for a nickel electrode comprising: nickel hydroxide powder active material; and

zinc or magnesium which is added to said active material at a rate in a range of 3–10 wt% or 1–3 wt%, respectively, said zinc and magnesium being in a solid solution in crystal of said nickel hydroxide, and in distribution of pore radii



calculated from the a desorption side at nitrogen adsorption isotherm of said powder, development of pore having a radius of 30 Å or more being prevented, and an entire pore volume rate being controlled at 0.05 ml/g or less.

4,985,319

PROCESS FOR MANUFACTURING A PHOTOMASK

Yaichiro Watakabe; Tatsuo Okamoto, and Shuichi Matsuda, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

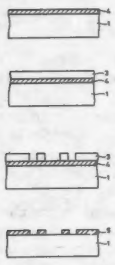
Continuation of Ser. No. 75,297, Jul. 17, 1987, abandoned. Continuation of Ser. No. 819,102, Jan. 15, 1986, abandoned. This application Oct. 23, 1989, Ser. No. 425,088

Claims priority, application Japan, Jan. 28, 1985, 60-16203

The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.

Int. Cl.[5] G03F *1/00*

U.S. Cl. 430—5 **2 Claims**



1. A process for manufacturing a photomask comprising the steps of:

preparing a substantially transparent glass substrate;

forming a metal silicide film opaque to visible light and having a thickness of about 1000 Å on a transparent glass substrate, said metal silicide film being selected from the group consisting of one of a silicide film of molybdenum and tungsten;

applying a resist on said metal silicide film;

providing a mask pattern of said resist by light or electron beam;

etching away at least an exposed portion of said metal silicide film by means of a dry etching process at an etching rate of about 500–1000 Å per minute.

4,985,320

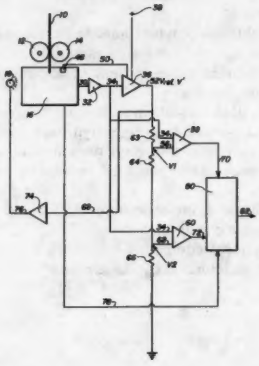
PROCESSOR CHEMISTRY CONTROL STRIP READER AND REPLENISHMENT SYSTEM

Charles D. Griffin, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1989, Ser. No. 492,485

Int. Cl.[5] G03C *5/26*; G03D *3/00, 13/00*

U.S. Cl. 430—30 **1 Claim**



1. A method for controlling replenishment chemistry in a photographic film processor, including a calibration circuit of the type using a light source and having one or more pre-determined density values located on a reference control strip, the location thereof being used for comparative purposes with the location of equivalent density values on a developer test control strip, the quantified difference between the measured and reference location being used to control automatically the film replenishment chemistry, wherein the improvement comprises the steps of:

generating a reference voltage based on an electrical signal output from a photodetector when no control strip is present between said light source and said photodetector, said reference voltage being maintained at a substantially constant level by means of a feedback loop which regulates the intensity of light emitted by the source, and wherein upon insertion of a freshly developed test control strip between the source and the photodetector, a set voltage substantially equals the value of said reference voltage just prior to the insertion of the control strip and,

wherein said set voltage is used as a set value in a voltage ratio network including at least one comparator to identify one or more pre-set density values.

4,985,321

THERMAL MASS TRANSFER OF METALLIC IMAGES

Hsin-Hsin Chou, Woodbury; William M. Lamanna, Stillwater, and Robin E. Wright, Inver Grove Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 283,596, Dec. 13, 1988, Pat. No. 4,892,798. This application Oct. 25, 1989, Ser. No. 427,042

Int. Cl.[5] G03G *13/10*

U.S. Cl. 430—38 **21 Claims**

1. A process for thermal mass transfer of a metallic image comprising the steps of:

(a) providing

(1) a toner fluid dispersion comprising electrostatically charged, colloidal elemental metal particles dispersed in an electrically nonconductive organic carrier liquid of dielectric constant less than 3.5 and having a volume resistivity greater than 10^{12} ohm.cm, and an amount of

a soluble surfactant effective to charge and stabilize said dispersion, said metal particles having sizes in the range of 1 to 100 nm,

(2) a dielectric or photoconductive substrate, and

(3) a thermoplastic receptor substrate,

(b) electrophoretically depositing the charged colloidal elemental metal particles of the toner fluid in a uniform or imagewise fashion on at least a portion of at least one surface of the dielectric or photoconductive substrate using standard electrographic techniques to provide a donor substrate bearing an electrically nonconductive, colloidal, elemental metal coating thereon,

(c) contacting said dielectric or photoconductive substrate surface bearing said metal coating with said thermoplastic receptor, and transferring, by application of energy, said metal coating from said dielectric or photoconductive substrate to said thermoplastic receptor substrate, to provide a metallic image on said receptor substrate.

4,985,322

PROCESS AND APPARATUS FOR PRODUCING PRINTING PLATES

Kyoichiro Azami, Chiba, and Shouji Kume, Tokyo, both of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 221,829, May 9, 1988, abandoned. This application Mar. 27, 1990, Ser. No. 500,109

Claims priority, application Japan, Sep. 10, 1986, 61-211501

Int. Cl.[5] G03G *13/01*

U.S. Cl. 430—49 **4 Claims**

1. A method of producing a printing plate, comprising the steps of:

forming toner images on an original printing plate by an electrophotographic process by using a photoconductive material as the original printing plate;

fixing said toner images formed on said original printing plate;

removing non-image portions of a photoconductive layer or rendering non-image portions hydrophilic directly from said original printing plate to produce a color-separated printing plate;

using an organic photoconductive material having light-sensitive characteristics at a whole light wavelength region of between 400 n.m. and 700 n.m. for said photoconductive material;

directly exposing said original printing plate to color-separated light obtained by color separating at least one of a transmitted light and a reflected light from a color original to thereby directly obtain a color-separated printing plate from said color original.

4,985,323

ELECTROPHOTOGRAPHIC PRINTING PLATE

Hiroaki Yokoya; Hiromichi Tachikawa, and Hideo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 29, 1988, Ser. No. 250,669

Claims priority, application Japan, Sep. 29, 1987, 62-244880; Feb. 10, 1988, 63-29619; Feb. 12, 1988, 63-30622; Feb. 16, 1988, 63-33758; Feb. 16, 1988, 63-33759; Feb. 16, 1988, 63-33760; Feb. 24, 1988, 63-41276; Feb. 24, 1988, 63-41277; Feb. 24, 1988, 63-41278; Feb. 24, 1988, 63-41279; Feb. 26, 1988, 63-43509; Feb. 26, 1988, 63-43511

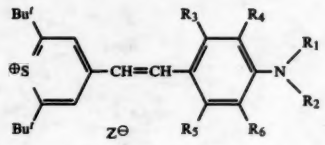
Int. Cl.[5] G03G *5/09*

U.S. Cl. 430—49 **29 Claims**

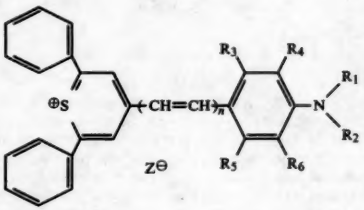
1. An electrophotographic printing plate produced by the removal of the non-image area on a photoconductive insulating layer by etching comprising a conductive support having a hydrophilic surface and provided thereon a photoconductive insulating layer containing:

(1) at least one organic photoconductive compound,

(2) at least one sensitizer selected from the group consisting of compounds represented by formula (A-I), (A-II), (B), (C-I), (C-II), (C-III), (C-IV), (D) or (E);

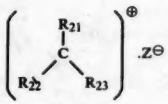


(A-I)



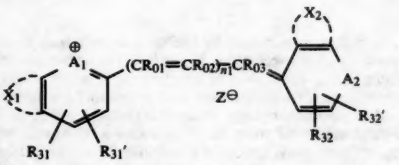
(A-II)

wherein Bu^t represents a t-butyl group; R_1 and R_2, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group having from 1 to 5 carbon atoms, or a substituted or unsubstituted aryl group having from 6 to 18 carbon atoms; R_3, R_4, R_5, and R_6, which may be the same or different, each represents a hydrogen atom, an alkyl group having from 1 to 5 carbon atoms, an alkoxy group having from 1 to 5 carbon atoms, or a halogen atom; $Z\ominus$ represents an anion; and n represents 0 or 1;

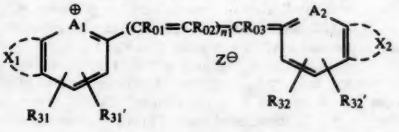


(B)

wherein R_{21} represents a hydrogen atom or a substituted or unsubstituted aryl group which may be condensed with a substituted or unsubstituted heterocyclic ring; R_{22} and R_{23}, each represents a substituted or unsubstituted aryl group which may be condensed with a substituted or unsubstituted heterocyclic ring; and $Z\ominus$ represents an anion;

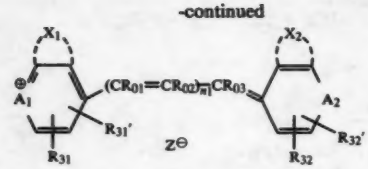


(C-I)

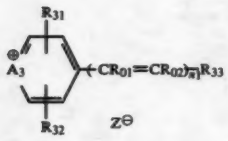


(C-II)

-continued

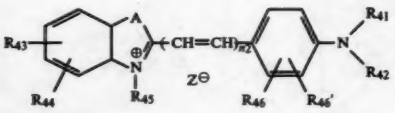


(C-III)



(C-IV)

wherein A_1 and A_2, which may be the same or different, each represents —O—, —S— or —Se—; A_3 represents —Se— or O; R_{31}, R_{31}', R_{32} and R_{32}', which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aralkyl group, or a substituted or unsubstituted aryl group; R_{33} represents a substituted or unsubstituted aryl group; X_1 and X_2 each represents nothing or a ring selected from the group consisting of a benzene ring, a naphthalene ring, an anthracene ring, and a phenanthrene ring which is condensed to the pyran, thiopyran or selenapyran ring; R_{01}, R_{02}, and R_{03}, which may be the same or different, each represents a hydrogen atom or a substituted or unsubstituted alkyl group; n_1 represents 0, 1 or 2,provided that when both of A_1 and A_2 represent —O— and when one of them represents —O—, and the other one represents —S—, n_1 represents 0 or 1; and $Z\oplus$ represents an anion;

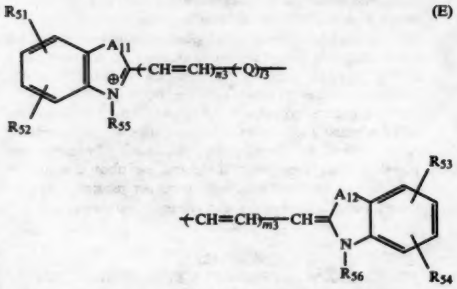


(D)

wherein A represents —O—, —S—, —Se—,

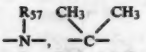
—CH=CH—, or

R_{41} and R_{42}, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aralkyl group, or a substituted or unsubstituted aryl group; R_{45} and R_{47}, which may be the same or different, each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aralkyl group, or a substituted or unsubstituted aryl group; R_{43}, R_{44}, R_{46}, and R_{46}' which may be the same or different, each represents a hydrogen atom, a halogen atom, a nitro group, an amido group, an acyl group, a cyano group, a trifluoromethyl group, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkneyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted alkenyl group, or a substituted or unsubstituted alkoxycarbonyl group; or R_{43} and R_{44} are taken together to form a ring, or R_{46} and R_{46}' are taken together to form a ring; n_2 represents 1 or 2, and $Z\ominus$ represents an anion;



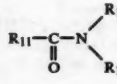
(E)

wherein A_{11} and A_{12}, which may be the same or different, each represents —O—, —S—, —Se—,

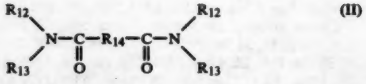


or —CH=CH—; R_{51}, R_{52}, R_{53}, and R_{54}, which may be the same or different, each represents a hydrogen atom, a halogen atom, a nitro group, an amido group, an acyl group, a cyano group, a trifluoromethyl group, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, or a substituted or unsubstituted alkoxycarbonyl group; or R_{51} and R_{52} are taken together to form a ring, or R_{53} and R_{54} are taken together to form a ring; R_{55}, R_{56}, and R_{57}, which may be the same or different, each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, substituted or unsubstituted aralkyl group, or a substituted or unsubstituted aryl group; Q represents a substituted or unsubstituted divalent aromatic hydrocarbon group or a substituted or unsubstituted divalent aromatic heterocyclic group; l_3 represents 0 or 1; m_3 and n_3 each represents 0 or 1; and $Z\ominus$ represents an anion;

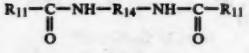
(3) at least one amide compound selected from the group consisting of compounds represented by formula (I), (II), or (III);



(I)



(II)



(III)

wherein R_{11} represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted monocyclic or condensed bicyclic aryl group, a substituted or unsubstituted monocyclic or condensed bicyclic aryloxy group, or a monovalent group derived from a substituted or unsubstituted heterocyclic ring, two R_{11} groups may be the same or

different; and R_{12} and R_{13}, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted monocyclic or condensed bicyclic aryl group, or a monovalent group derived from a substituted or unsubstituted heterocyclic ring; R_{11} and R_{12}, or R_{12} and R_{13} may be connected to each other to form a divalent group; and R_{14} represents a melhylene group, a polymethylene group, a branched alkanediyl group, or an arylene group; and

(4) a binder resin soluble or dispersible in an alkaline solvent.

4,985,324

ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Katsuji Kitatani; Naonori Makino; Satoshi Hoshi; Hideo Sato, and Shigeru Ohno, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

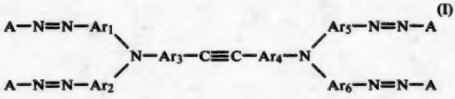
Filed Oct. 16, 1989, Ser. No. 421,901

Claims priority, application Japan, Oct. 18, 1988, 63-262200

Int. Cl.[5] G03G *5/06, 5/14*

U.S. Cl. 430—56 **12 Claims**

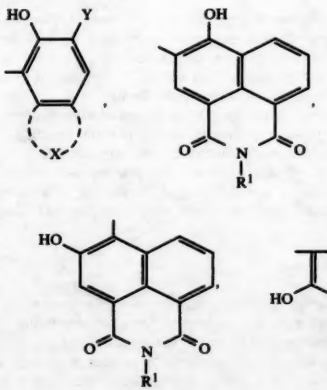
1. An electrophotograpahic photoreceptor comprising an electroconductive support having thereon a layer containing a charge carrier-transporting compound and a charge carrier-generating compound or having thereon a layer containing a charge carrier-transporting compound and a layer containing a charge carrier-generating compound, wherein the photoreceptor contains a tetrakisazo compound of the following formula (I) as the charge carrier-generating compound:



(I)

wherein Ar_1, Ar_2, Ar_3, Ar_4, Ar_5 and Ar_6, which may be the same or different, each represents an arylene group, a divalent condensed polycyclic aromatic group or a divalent heterocyclic aromatic group;

A represents



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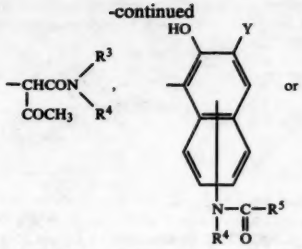
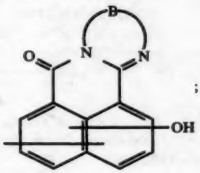


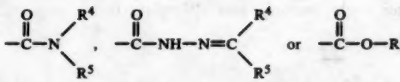
or



;

X represents an atomic group necessary to form an aromatic ring or heterocyclic ring condensed with the bensene ring of the formula having the hydroxyl group and Y bonded thereto;

Y represent



R^1 represents an alkyl group or a phenyl group;

R^2 represents a hydrogen atom, a lower alkyl group, a carbamoyl group, a carboxyl group, an alkoxycarbonyl group, an aryloxycarbonyl group or an amino group;

R^3 represents an alkyl group, an aromatic group or a heterocyclic aromatic group;

R^4 and R^5, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aromatic group or a heterocyclic aromatic group, provided that both R^4 and R^5 are not simultaneously hydrogen atoms;

when Y represents

R^5 is not a hydrogen atom; and

B represents a divalent aromatic hydrocarbon residue or a divalent heterocyclic group containing a nitrogen atom (s) in the ring.

4,985,325

PHOTOCONDUCTOR FOR ELECTROPHOTOGRAPHY CONTAINING HYDRAZONE

Masami Kuroda; Yoshinobu Sugata, and Noboru Furusho, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Sep. 13, 1989, Ser. No. 406,807

Claims priority, application Japan, Sep. 17, 1988, 63-233104

Int. Cl.[5] G03G *5/14*

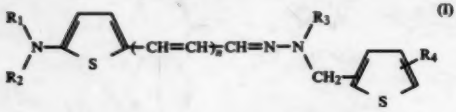
U.S. Cl. 430—59 **15 Claims**

1. A photoconductor for electrography comprising:

a substrate; and

a photosensitive layer formed on the substrate and containing a charge generating substance and at least one of

hydrazone compounds represented by the following general formula (I) as a charge transporting substance;



(I)

wherein, each of R_1, R_2 and R_3 stands for any one of an alkyl group, an alkenyl group, an aralkyl group and an aryl group, which groups may be or not may be substituted, R_4 stands for any one of a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, an aralkyl group and an aryl group, which groups may be or not may be substituted and n stands for an integer of 0 or 1.

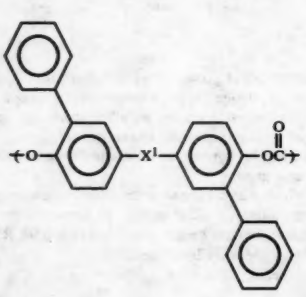
4,985,326

ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Shuji Sakamoto, Chiba, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1989, Ser. No. 385,468
Int. Cl.[5] G03G 5/04
U.S. Cl. 430—96 **17 Claims**

1. An electrophotographic photoreceptor comprising an electroconductive substrate and a photosensitive layer disposed on one surface of said electroconductive substrate, wherein said photosensitive layer contains a binder-resin comprising (A) a polycarbonate having the repeating unit represented by the following general formula (I):



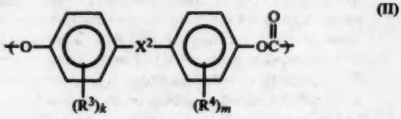
(I)

wherein

X^1 in the formula (I) is

R^1 and R^2 each independently being hydrogen atom, an alkyl group having a carbon number of 1 to 6 or an aryl group having a carbon number of 6 to 12,

n being an integer of 4 to 10, $—(CH_2)_p—$, p being an integer of 2 to 10, a single bond, —O—, —S—, —SO—, or —SO or (B) a polycarbonate copolymer comprising both the repeating unit represented by the general formula (I) and the repeating unit represented by the following general formula (II):



(II)

wherein

R^3 and R^4 in the general formula (II) each are independently a halogen atom, an alkyl group having a carbon number of 1 to 6 or cyclohexyl group;

k and m are each independently an integer of 0 to 4; and

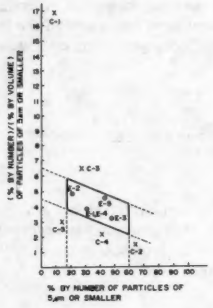
the definition of X^2 is the same as the definition of X^1 in the general formula (I) as described above, with the proviso that X^1 and X^2 are identical with or different from each other.

4,985,327

NON-MAGNETIC TONER

Kiichiro Sakashita, Inagi; Hirohide Tanikawa, Yokohama; Satoshi Yoshida, Kawasaki; Toshiaki Nakahara, Tokyo; Naoki Matsushige, Kawasaki; Masatsugu Fujiwara, and Yasuo Mitsuhashi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1990, Ser. No. 526,680
Claims priority, application Japan, Feb. 24, 1988, 63-41453; Feb. 25, 1988, 63-43116
Int. Cl.[5] G03G 9/08, 9/10, 9/14
U.S. Cl. 430—106.6 **35 Claims**



1. A developer for developing electrostatic images, comprising a non-magnetic toner, said toner containing 17–60% by number of non-magnetic toner particles having a particle size of 5 microns or smaller, containing 1–30% by number of non-magnetic toner particles having a particle size of 8–12.7 microns, and containing 2.0% by volume or less of non-magnetic toner particles having a particle size of 16 microns or larger;

wherein the non-magnetic toner has a volume-average particle size of 4–10 microns, and the non-magnetic toner particles having a particle size of 5 microns or smaller have a particle size distribution satisfying the following formula:

$$N/V = -0.04N + k$$

wherein N denotes the percentage by number of non-magnetic toner particles having a particle size of 5 micron or smaller, V denotes the percentage by volume of non-magnetic toner particles having a particle size of 5 microns or smaller, k denotes a positive number of 4.5–6.5, and N denotes a positive number of 17–60.

19. A developer according to claim 1, wherein the non-magnetic toner has been mixed with a carrier.

25. A developer according to claim 19, wherein the carrier comprises magnetic particles.

4,985,328

DRY TONER, DRY DEVELOPER AND PROCESS FOR FORMING ELECTROPHOTOGRAPHIC IMAGES

Yuugo Kumagai; Ryouji Tan, both of Hitachi; Takashi Ikeda, Katsuta; Tetsuya Fujii, Hitachi; Chiaki Okada, Hitachi; Osamu Higashida, Hitachi; Hatuo Sugitani, Ibaraki, and Masato Fukasawa, Hitachi, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1989, Ser. No. 410,416

Claims priority, application Japan, Sep. 22, 1988, 63-237890; Nov. 22, 1988, 63-295731; Jan. 13, 1989, 1-007099; Mar. 28, 1989, 1-075892; Mar. 28, 1989, 1-075893; Apr. 19, 1989, 1-099170; Apr. 28, 1989, 1-111194; Apr. 28, 1989, 1-111195; May 10, 1989, 1-116589; May 18, 1989, 1-124980

Int. Cl.[5] G02G 9/08, 9/14

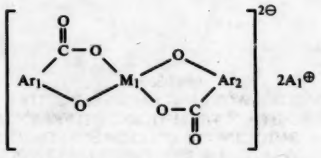
U.S. Cl. 430—110 31 Claims

1. A dry toner composition for mixing with a carrier comprising

(A) a binder resin;

(B) a colorant;

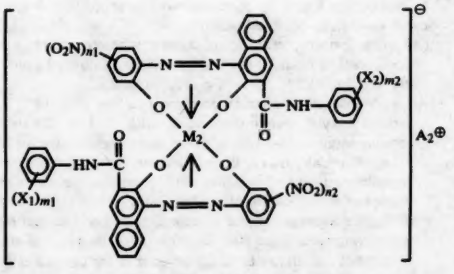
(C) charge control agents comprising a metal complex of oxycarboxylic acid (C-1) represented by the formula:



(I)

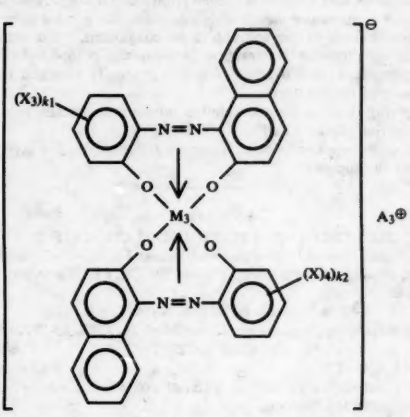
wherein Ar_1 and Ar_2 are independently a residue of an aromatic oxycarboxylic acid or a derivative thereof; M_1 is a zinc atom; $A_1\oplus$ is a hydrogen ion, a sodium ion, a potassium ion or an ammonium ion,

a metal complex of azo compound (C-2) represented by the formula:



(II)

wherein X_1 and X_2 are independently hydrogen, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a nitro group, or a halogen atom; m_1 and m_2 are independently an integer of 1 to 3; n_1 and n_2 are independently an integer of 1 or 2; M_2 is a chromium atom; and $A_2\oplus$ is a hydrogen ion, a sodium ion, a potassium ion, or an ammonium ion, and/or represented by the formula:



(III)

wherein X_3 and X_4 are independently $-NO_2$, $-CH_3$, $-SO_3H$, $-Cl$ or $-SO_2NH_2$; k_1 and k_2 are independently an integer of 1 or 2; M_3 is a chromium atom; and $A_3\oplus$ is a hydrogen ion, a sodium ion, a potassium ion, or an ammonium ion,

the weight ratio of (C-1)/(C-2) being 1/9 to 9/1, and a total weight of (C-1) and (C-2) being 0.5 to 5% by weight; and 0.1 to 1% by weight of a silica powder and 0.05 to 2% by weight of a magnetic powder, each based on the weight of a toner matrix comprising (A), (B) and (C).

4,985,329

BIPOLAR LIQUID ELECTROSTATIC DEVELOPER

Lyla M. El-Sayed, West Chester, Pa.; Sanford M. Marcus, Wilmington, and Torence J. Trout, Yorklyn, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 30, 1988, Ser. No. 292,573

Int. Cl.[5] G03G 9/135

U.S. Cl. 430—115 22 Claims

1. A bipolar liquid electrostatic developer consisting essentially of two compatible soluble charge directors present in a nonpolar liquid having dispersed therein two toner particles having opposite charge polarity which comprise at least one thermoplastic copolymer resin, the two toner charged particles having an average by area particle size of less than 10 μm and being present in a ratio of 5 to 95 and 95 to 5.

4,985,330

PHOTOSENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY AND METHOD FOR MAKING SAME

Sohji Tsuchiya, Kanagawa; Mutsuaki Murakami, Machida, and Susumu Yoshimura, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 7, 1989, Ser. No. 432,838

Claims priority, application Japan, Nov. 8, 1988, 63-281722; Nov. 8, 1988, 63-281721

Int. Cl.[5] G03G 5/06

U.S. Cl. 430—130 7 Claims

1. A process for forming a photosensitive material for electrophotography which comprises:

preparing a solution of a charge-generating compound and/or a charge transfer compound and a resin binder in an organic solvent wherein the charge-generating compound and/or charge transfer compound, the resin binder and the organic solvent have, respectively, a ring structure in the molecule;

subjecting the solution to low temperature treatment wherein said solution is cooled from normal temperatures to a temperature which does not cause the solutes to be precipitated or the solution to be coagulated, for a time enough to allow interaction between the compound or compounds and the binder and is gradually returned to normal temperatures;

applying the thus treated solution onto an electrically conductive support; and

drying the applied solution to form a photoconductive layer on the support.

4,985,331

MULTI-COLOR RECORDING MATERIALS

Keiso Saeki; Fumiaki Shinozaki, and Yutaka Fujita, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 27, 1989, Ser. No. 441,664

Claims priority, application Japan, Nov. 25, 1988, 63-297354

Int. Cl.[5] G03C *1/727, 1/72*

U.S. Cl. 430—138 **9 Claims**

1. A two color recording material comprising a support having provided thereon:

(a) a light-sensitive heat-sensitive color forming layer comprising (i) microcapsules containing a leuco dye which is capable of forming a color by oxidation and a photo-oxidizing agent and (ii) a reducing agent; and

(b) a heat-sensitive color forming layer having a color forming temperature differing from the glass transition temperature of said microcapsule walls, and which comprises an electron donating leuco dye capable of forming a color of a hue differing from that of said light-sensitive heat-sensitive layer and an electron accepting compound capable of reacting with said electron donating leuco dye to form a color.

4,985,332

RESIST MATERIAL WITH CARBAZOLE DIAZONIUM SALT ACID GENERATOR AND PROCESS FOR USE

Albert G. Anderson, Wilmington, Del.; Walter R. Hertler, Kennett Square, Pa.; Robert C. Wheland, and Yuan Yu G. Chen, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

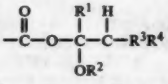
Filed Apr. 10, 1990, Ser. No. 508,134

Int. Cl.[5] G03C *1/60*

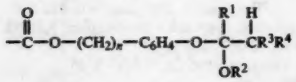
U.S. Cl. 430—176 **20 Claims**

1. A material comprising:

a polymer chosen from the group consisting of compositions having a polymer backbone and pendant acid labile groups bound directly or indirectly to said backbone, said pendant groups represented by the formula:



or



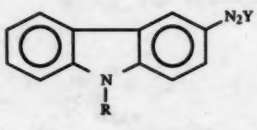
wherein

n=0–4

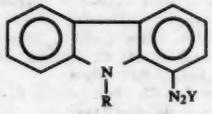
R^1 is hydrogen or a C_1–C_6 alkyl;

R^2 is a C_1–C_6 alkyl; and

R^3 and R^4 independently are hydrogen or C_1–C_6 alkyl where the definition of C_1–D_6 alkyl includes the joining of R^1 and R^2 or R^1 and either R^3 or R^4, or R^2 and either R^3 or R^4 to form a 5-, 6- or 7-membered ring; and material that forms an acid upon irradiation comprising carbazole diazonium salts of the structures:



or



wherein:

Y is PF_6^-, AsF_6^-, SbF_6^-, $FeCl_4^-$, $SnCl_6^{-2}$, $SbCl_6^-$, BF_4^- or $BiCl_5^{-2}$; and R is selected from the group consisting of C_xH_{2x+1} where x is 1–16, benzyl, phenyl, substituted benzyl, substituted phenyl and cycloalkyl, provided, however, where N_2Y is in the "1" position as in the second structure, R is not phenyl or substituted phenyl.

4,985,333

POSITIVE-WORKING PHOTOSENSITIVE COMPOSITION WITH THREE DIFFERENCE 1,2-NAPHTHOQUINONE DIAZIDE SULFONIC ACID ESTERS TO INCLUDE THE ESTER OF CURCUMIN

Nobuo Tokutake, Samukawa; Koichi Takahashi, Sagamihara; Yoshiyuki Satoh, Machida; Hidekatsu Kohara, Chigasaki, and Toshimasa Nakayama, Hiratsuka, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 274,928, Nov. 22, 1988, abandoned. This application Jul. 27, 1989, Ser. No. 385,820

Claims priority, application Japan, Apr. 22, 1988, 63-98247

Int. Cl.[5] G03F *7/023;* G03C *1/54, 1/60*

U.S. Cl. 430—192 **5 Claims**

1. A positive-working photosensitive composition which consists essentially of, in admixture:

(A) a film-forming cresol novolak resin; wherein said resin is composed of from 10 to 45% by weight of m-cresol moiety and from 90 to 95% of p-cresol moiety,

(B) a photosensitive mixture comprising a first ester of 2, 3, 4-trihydroxy benzophenone with 1, 2-naphthoquinonediazido-5-sulfonic acid and a second ester of 2, 3, 4, 4'-tetrahydroxy benzophenone with 1, 2-naphthoquinonediazido-5-sulfonic acid, wherein the average degree of esterification of the first ester comprises at least 80%, the average degree of esterification of the second ester comprises from 50% to 80%, and the ratio of the amount of the first ester to the amount of the second ester comprises from 5:95 to 55:45 by weight; and,

(C) an ester of curcumin with 1, 2-naphthoquinone diazidosulfonic acid, wherein the average degree of esterification of said ester of curcumin comprises from 30% to 80%; and,

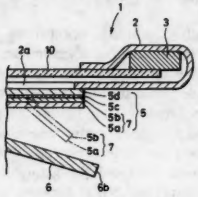
wherein, the ratio of the amount of component (B) to the amount of component (C) comprises from 99:1 to 30:70 by weight.

4,985,334

SELF-PROCESSING FILM UNIT

Hideaki Katsoka, and Kenji Sashihara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 27, 1990, Ser. No. 499,670
Claims priority, application Japan, Mar. 27, 1989, 1-74545
Int. Cl.[5] G03C 3/00; G03D 5/02
U.S. Cl. 430—207 15 Claims



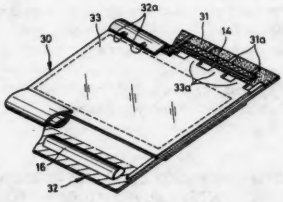
1. A self-processing film unit in which an image recording sheet with a positive image formed therein is peeled off after processing, and an over sheet secured to said unit for covering a surface from which said image recording sheet has been peeled off.

4,985,335

SELF-PROCESSING FILM UNIT

Hiroki Omote, and Hideaki Katsoka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 20, 1990, Ser. No. 496,951
Claims priority, application Japan, Mar. 20, 1989, 1-68953; Feb. 23, 1990, 2-43737
Int. Cl.[5] G03C 3/00; G03D 5/02
U.S. Cl. 430—209 12 Claims



1. A self-processing film unit having a mask sheet which is provided with an opening defining an image forming area, a cover sheet closing said image forming area, a supply of processing solution, a trapping member which is adapted to catch surplus processing solution, one end of said mask sheet being folded back in such a manner as to enclose said trapping member and being secured to said cover sheet, an air venting passage being formed in said mask sheet, said cover sheet having first and second portions adjacent said trapping member, said first and second portions extending from away from said opening toward said folded back end, the length of said first portion being greater than the length of said second portion, said air venting passage registering with said first portion.

4,985,336

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Seiji Ichijima, and Keiji Mihayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 889,146, Jul. 24, 1986, abandoned. This application Jan. 6, 1989, Ser. No. 294,957
Claims priority, application Japan, Jul. 24, 1985, 60-163759
Int. Cl.[5] G03C 8/00; 7/305
U.S. Cl. 430—223 19 Claims

1. A silver halide color photographic light-sensitive material comprising a support having provided thereon at least one red-sensitive silver halide emulsion layer, at least one green-sensitive silver halide emulsion layer, and at lest one blue-sensitive silver halide emulsion layer, wherein at least one red-sensitive silver halide emulsion layer and at least one green-sensitive silver halide emulsion layer each contains a precursor compound capable of releasing a compound upon reacting with an oxidation product of a developing agent, and said released compound releases a development inhibitor group upon further reacting with another molecule of the oxidation product of the developing agent, wherein said precursor compound which releases a compound upon reacting with an oxidation of product of a developing agent is represent by formula (I):

$$A—(L_1)_v—B—(L_2)_w—DI \quad (I)$$

wherein A represents a group which releases $(L_1)_v—B—(L_2)_w—DI$ upon reacting with an oxidation product of a developing agent; L_1 represents a group which releases $B—(L_2)_w—DI$ after being released from A; B releases a group which releases $(L_2)_w—DI$ upon reacting with an oxidation product of a developing agent after being released form $A—(L_1)_v$; L_2 represents a group which releases DI after being released from B; DI represents a development inhibitor group; and v and w each represents 0 or 1, and wherein the group B is an oxidation-reduction group represented by the formula (B-1):

$$*—P—(X'=Y')_n—Q—A_2 \quad (B—1)$$

wherein * indicates a position for bonding to $A—(L_1)_v$; X' and Y' each represent a substituted or unsubstituted methine group or a nitrogen group, provided that at least one of time is a methine group substituted with $(L_2)_w—DI$; and any two of A_2, P, Q, X' and Y' may be linked together to form a cyclic structure; A_2 represents a hydrogen atom or a group releasable by an alkali; P and Q each represents an oxygen atom or a substituted or unsubstituted imino group; and n represents an integer of from 1 to 3.

4,985,337

IMAGE FORMING METHOD AND ELEMENT, IN WHICH THE ELEMENT CONTAINS A RELEASE LAYER AND A PHOTOSENSITIVE O-QUINONE DIAZIODE LAYER

Nobumasa Sasa; Kunio Shimizu; Manabu Watanabe, all of Hino; Toshiyuki Urano, Machida; Shinya Mayama, Yamato, and Tetsuya Masuda, Yokohama, all of Japan, assignors to Konica Corporation and Mitsubishi Kasei Corporation, both of Tokyo, Japan

Filed Nov. 9, 1989, Ser. No. 434,083
Claims priority, application Japan, Nov. 15, 1988, 63-288457; Dec. 26, 1988, 63-328716
Int. Cl.[5] G03C 1/52
U.S. Cl. 430—254 44 Claims

1. A color image forming method comprising the steps of:

(I) imagewise exposing an image forming material wherein said image forming material comprises:

(1) a support;

(2) a releasing layer provided on said support wherein said releasing layer is formed of an ethylene-vinylacetate copolymer; and

(3) a light-sensitive layer is provided on said releasing layer to produce an imagewise portion corresponding

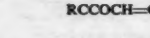
to said exposing step, said light-sensitive layer comprising

(i) a colorant,

(ii) light-sensitive o-quinonediazide compound or compositions containing both of a photoacid generating agent and a compound having a bond decomposable with an acid, and

(iii) a polymeric compound which is

(a) a homopolymer of a first monomer represented by the formula:



wherein R in said first monomer is an alkyl having 1 to 17 carbon atoms; or

(b) a copolymer comprising said first monomer and a second monomer;

(II) developing said image forming material and

(III) transferring said imagewise portion of said light-sensitive layer onto an image receiving material wherein said releasing layer remains on said support.

23. A color image forming material comprising:

(1) a support;

(2) a releasing layer provided on said support wherein said releasing a layer is formed of an ethlyene-vinylacetate copolymer; and

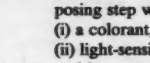
(3) a light-sensitive layer provided on said releasing layer to produce an imagewise portion corresponding to said exposing step wherein said light-sensitive layer comprises

(i) a colorant,

(ii) light-sensitive o-quinonediazide compound or compositions containing both of a photoacid generating agent and a compound having a bond decomposable with an acid, and

(iii) a polymeric compound which is

(a) a homopolymer of a first monomer represented by the formula:



wherein R in said first monomer is an alkyl having 1 to 17 carbon atoms; or

(b) a copolymer comprising said first monomer and a second monomer;

whereby said releasing layer remains on said support after said imagewise portion of said light-sensitive layer is transferred onto an image receiving material.

4,985,338

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Minoru Sakai; Kazunobu Katoh; Jiro Yamaguchi; Hisashi Okada; Tomokazu Yasuda, and Masaki Satake, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 10, 1989, Ser. No. 322,456

Claims priority, application Japan, Mar. 10, 1988, 63-057303

Int. Cl.[5] G03C *1/34*

U.S. Cl. 430—264 8 Claims

1. A silver halide photographic material comprising a support having provided thereon at least one hydrophilic colloid layer containing gelatin, said hydrophilic colloid layer comprising polymer particles which contain a hydrazine derivative, said hydrazine derivative being contained in the polymer particles by dissolving the hydrazine derivative and the polymer in a water insoluble low boiling point organic solvent and emulsifying and dispersing the resulting solution in a gelatin aqueous solution, wherein said polymer contains no acid groups.

4,985,339

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT, POLYMERIZABLE COMPOUND AND A POLYMERIC BINDER

Shigeo Koizumi, Shizuoka, and Yoshihide Hayakawa, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 11, 1988, Ser. No. 217,207

Claims priority, application Japan, Jul. 10, 1987, 62-172400

Int. Cl.[5] G03C *1/68, 1/72*

U.S. Cl. 430—270 6 Claims

1. A light-sensitive material comprising a light-sensitive layer containing a light-sensitive silver halide, a reducing agent and a polymerizable compound having an ethylenic unsaturated group provided on a support, wherein the light-sensitive layer contains a polymer binder having an ethylenic unsaturated double bonding group in its side chain, wherein said polymer binder comprises at least one copolymer derived from a first monomer selected from the group consisting of allyl acrylate, allyl methacrylate, vinyl acrylate and vinyl methacrylate and a second monomer copolymerizable with the first monomer.

4,985,340

ENERGY CURABLE COMPOSITIONS: TWO COMPONENT CURING AGENTS

Michael C. Palazzotto, and Robert J. DeVoe, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 1, 1988, Ser. No. 201,572

Int. Cl.[5] C08G *18/04, 18/22, 18/32;* G03F *7/029*

U.S. Cl. 430—270 42 Claims

1. A method comprising the steps of:

(a) providing a mixture comprising a polymeric precursor composition selected from the group consisting of

(1) at least one di- and polysiocyanates, and at least one compound bearing at least two isocyanate-reactive hydrogen aotms, the isocyanate and reactive hydrogen-containing compound constituting polyurethane precursors, and

(2) at least one ethylenically-unsaturated compound, at least one isocyanate selected from di- and polyisocyanates, and at least one compound bearing at least two isocyanate-reactive hydrogen atoms, the isocyanate and reactive hydrogen-containing compound constituting polyurethane precursors, and

a catalytically effective amount of a two-component curing agent for (1) and (2) comprising

(1) an organometallic salt, and

(2) an onium salt;

(b) allowing said mixture to polymerize or adding energy to said mixture to effect polymerization.

4,985,341

PHOTOPOLYMERIZABLE MIXTURE, AND A RECORDING MATERIAL PRODUCED THEREFROM

Klaus Rode, Wiesbaden; Dieter Mohr, Budenheim; Werner Frass, Wiesbaden-Naurod, and Joachim Gersdorf, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 21, 1988, Ser. No. 287,279

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743455

Int. Cl.[5] G03F *7/031*

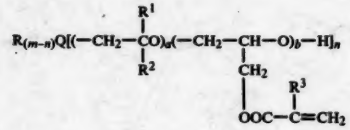
U.S. Cl. 430—287 26 Claims

1. A photopolymerizable composition comprising:

(a) a polymeric binder,

(b) an acrylate or alkacrylate of a polyhydric alcohol, said acrylate or alkacrylate being free of urethane groups and further comprising at least one group which is photooxidizable on exposure to actinic radiation in the presence of

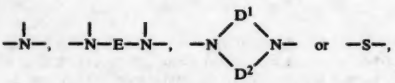
a photoreducible dye, wherein said acrylate or alkacrylate is a compound of the formula I



(I)

in which

Q denotes



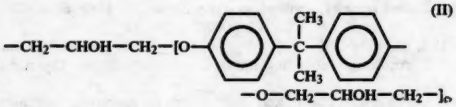
R denotes an alkyl, hydroxyalkyl or aryl group,

R^1 and R^2 are identical or different, and each denote a hydrogen atom, an alkyl group or an alkoxyalkyl group,

R^3 denotes a hydrogen atom, a methyl group or an ethyl group,

D^1 and D^2 are identical or different, and each denote a saturated hydrocarbon group having 1 to 5 carbon atoms,

E denotes a saturated hydrocarbon group having 2 to 12 carbon atoms, a cycloaliphatic group having 5 to 7 ring members and comprising from zero to two N, O or S atoms as ring members, an arylene group having 6 to 12 carbon atoms, a heterocyclic aromatic group having 5 or 6 ring members or a group of the formula II



(II)

a and b denote integers from 1 to 4,

c denotes an integer from 1 to 3,

m denotes 2, 3 or 4, depending on the valency of Q, and

n denotes an integer from 1 to m,

where all radicals of the same definition may be identical to or different from one another,

(c) a photoinitiator comprising a photoreducible dye, and

(d) a second photoinitiatior comprising a trihalomethyl compound capable of being cleaved by irradiation.

4,985,342

POLYSILOXANE PATTERN-FORMING MATERIAL WITH $SiO_{4/2}$ UNITS AND PATTERN FORMATION METHOD USING SAME

Naohiro Muramoto, Chiba, and Katsutoshi Mine, Ichihara, both of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Nov. 7, 1988, Ser. No. 268,109

Claims priority, application Japan, Nov. 9, 1987, 62-286638

Int. Cl.[5] G03C 1/72; G03F 7/075

U.S. Cl. 430—280 **17 Claims**

1. A pattern-forming material consisting essentially of a solvent-soluble polyorganosiloxane having 10 to 90 mole % $SiO_{4/2}$ units and other organosiloxane units selected from the group consisting of $R^1SiO_{3/2}$, $R^2R^3SiO_{2/2}$, and $R^4R^5R^6SiO_{1/2}$ to make up the total constituent siloxane units, in the general formulae of the organosiloxane units, R^1 through R^6 are each a group selected from the group consisting of hydrogen, hydroxyl, and monovalent organic group, said polyorganosiloxane has a softening temperature greater than room temperature, and contains in each molecule at least one group sensitive to high-energy radiation selected from the group consisting of hydrogen bonded to silicon, alkyl groups having at least 2 carbon atoms, halogenated hydrocarbon groups, alkenyl groups, 3-acryloxypropyl, acryloxymethyl, 3-methacryloxypropyl, 3-acrylamidopropyl, 3-mercaptopropyl, 3-glycidoxypropyl, 2-(3,4-epoxycyclohexyl)ethyl, 3-aminopropyl, 3-(2-aminoethyl)aminopropyl, 2-(p-azidobenzoyl)ethyl, and 3-(p-azido-m-methylbenzoyl)propyl.

4,985,343

CROSSLINKING-CURABLE RESIN COMPOSITION

Kenji Kushi; Ken-ichi Inukai; Takayuki Iseki, and Yasuyuki Fujimoto, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1990, Ser. No. 473,449

Claims priority, application Japan, Feb. 9, 1989, 1-28662; Oct. 9, 1989, 1-263511; Oct. 11, 1989, 1-264598

Int. Cl.[5] G03C 1/725

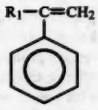
U.S. Cl. 430—285 **10 Claims**

1. A crosslinking-curable resin composition consisting essentially of

(a) 40 to 70 parts by weight of a thermoplastic polymer binder obtained by copolymerizing

(1) 15 to 35% by weight of a first polymerizable substance comprising one or more α,β-unsaturated carboxyl-containing monomers having 3 to 15 carbon atoms,

(2) 2 to 25% by weight of a second polymerizable substance comprising one or more compounds selected from the group consisting of compounds of the general formula



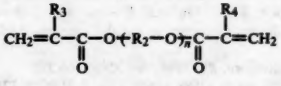
[I]

where R_1 is hydrogen, an alkyl group of 1 to 6 carbon atoms, or a halogen, and ring-substituted derivatives thereof,

(3) 10 to 40% by weight of a third polymerizable substance comprising one or more compounds selected from the group consisting of alkyl acrylates having an alkyl group of 1 to 8 carbon atoms, and hydroxyalkyl acrylates having a hydroxyalkyl group of 2 to 8 carbon atoms, and

(4) 30 to 65% by weight of a fourth polymerizable substance comprising one or more compounds selected from the group consisting of alkyl methacrylates having an alkyl group of 1 to 8 carbon atoms, and hydroxyalkyl methacrylates having a hydroxyalkyl group of 2 to 8 carbon atoms;

(b) 25 to 50 parts by weight of a crosslinkable monomer having one or more ethylenically unsaturated groups in the molecule and containing 51 to 100% by weight of a compound of the general formula



[II]

where R_2 is an alkylene group of 3 to 6 carbon atoms, R_3 and R_4 are hydrogen or methyl, and n is a positive whole number of 5 to 9; and

(c) 0 to 10 parts by weight of a photopolymerization initiator;

the combined amount of components (a) to (c) being 100 parts by weight.

4,985,344

RADIATION IMAGING PROCESS FOR FORMING PATTERN WITHOUT ALKALI-SOLUBLE POLYMER UNDERLAYER AND WATER SOLUBLE RADIATION-SENSITIVE DIAZONIUM SALT OVERLAYER

Shoichi Uchino, Hachioji, Japan; Takumi Ueno, Bonn, Fed. Rep. of Germany; Takao Iwayanagi, Tokyo, Japan; Saburo Nonogaki, Tokyo, Japan, and Michiaki Hashimoto, Sayama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 69,175, Jul. 2, 1987, abandoned. This application Oct. 13, 1989, Ser. No. 423,554

Claims priority, application Japan, Jul. 4, 1986, 61-156098

Int. Cl.[5] G03F 7/021; G02F 7/30

U.S. Cl. 430—325 20 Claims

1. A process for forming a pattern comprising forming an alkali-soluble polymer layer on a substrate; forming a radiation-sensitive composition layer, containing a radiation-sensitive composition including an admixture of (1) a radiation-sensitive aromatic diazonium salt, and (2) an organic polymer, on said alkali-soluble polymer layer, thereby providing a boundary between the alkali-soluble polymer layer and the radiation-sensitive composition layer, to form a radiation-sensitive resist layer having a two-layer structure, the organic polymer of the radiation-sensitive composition being a water-soluble polymer, the radiation-sensitive composition layer and alkali-soluble polymer layer being such layers that solubility, to an aqueous alkaline solution, of exposed areas at the boundary between the alkali-soluble polymer layer and the radiation-sensitive composition layer is decreased, as compared to solubility of unexposed areas at the boundary; and forming a predetermined pattern in said radiation-sensitive resist layer by a pattern-forming process, said forming including exposing the two-layer structure to radiation to decrease solubility of the exposed structure to an aqueous alkaline solution at the boundary between the radiation-sensitive composition layer and the alkali-soluble polymer layer, removing the radiation-sensitive composition layer by washing with water, and then developing the exposed structure with an aqueous alkaline solution so as to remove unexposed portions of the two-layer structure, without removing exposed portions, due to the decreased solubility of the exposed structure, to an aqueous alkaline solution, at said boundary, so as to form the predetermined pattern.

4,985,345

RECORDING MATERIAL

Kunio Hayakawa, Gotenba; Hiromi Furuya, Shimizu; Hisanori Shimada, Numazu; Masahiro Nakata, Kawanishi; Kaoru Kodera, Toyonaka; Kouji Oohara, Osaka, and Nobuo Akagi, Sakai, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

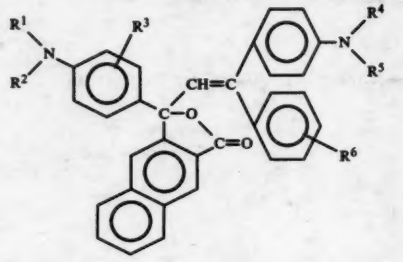
Filed Jan. 22, 1990, Ser. No. 468,285

Claims priority, application Japan, Feb. 2, 1989, 1-22483; Jun. 29, 1989, 1-169148

Int. Cl.[5] G03C 1/73; B41M 5/20

U.S. Cl. 430—335 22 Claims

1. A recording material comprising at least one leuco dye having formula (I), which is colored when brought into contact with a color developer capable of inducing color formation in the leuco dye:



(I)

wherein R^1 and R^2 each represent an alkyl group having 1 to 6 carbon atoms, a cycloalkyl group, an aralkyl group which may have a substituent, or an aryl group which may have a substituent, which R^1 and R^2 in combination may form a ring or a morpholine ring through an oxygen atom; R^3 represents hydrogen, an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms or an aralkyloxy group; R^4 and R^5 each represent an alkyl group having 1 to 4 carbon atoms; and R^6 represents hydrogen, an alkyl group having 1 to 4 carbon atoms or a halogen.

4,985,346

PHOTO AND HEAT SENSITIVE RECORDING MEDIUM AND IMAGE RECORDING METHOD

Kouji Suzuki, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 23, 1989, Ser. No. 315,436

Claims priority, application Japan, Mar. 16, 1988, 63-62809

Int. Cl.[5] G03C 5/16

U.S. Cl. 430—350 1 Claim

1. An image recording method, which comprises the steps of:

providing a photo and heat sensitive recording medium having a front side coated with a layer of a photo-curable composition, said layer also having heat fusibility in an uncured state but non-heat fusibility in a cured state;

exposing said recording medium to light providing image information, to photo-cure light-illuminated areas of said layer of photo-curable composition to form a latent image of said image information on said layer;

superimposing said recording medium and a developing medium upon which a visible image of said image information is desired so that said front side contacts said recording medium; and

heating the superimposed recording medium and developing medium to transfer the heat fusible uncured portions of said layer whereby a visible image corresponding to said image information is developed on said developing medium.

4,985,347

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS COMPRISING THE USE OF SPECIFIC BLEACHING AGENTS AND HYDROXYLAMINES

Hiroshi Fujimoto; Morio Yagihara, and Takatoshi Ishikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 171,363, Mar. 21, 1988, abandoned. This application Jul. 25, 1990, Ser. No. 560,493

Claims priority, application Japan, Mar. 19, 1987, 62-65115

Int. Cl.[5] G03C 7/00, 7/42

U.S. Cl. 430—393 12 Claims

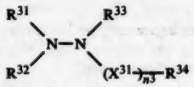
1. A method for processing a silver halide color photographic material, which comprises processing a silver halide color photographic material with a color developer containing

from 0 to 0.005 mol of sulfite ion per liter of developing solution and then processing the color photographic material with a solution having bleaching capability containing an aminopolycarboxylic acid having a molecular weight of at least 300, wherein said color developer contains a compound represented by formula (I) or (III):

(I)

wherein R^{11} and R^{12} each represents a substituted alkyl group, a substituted alkenyl group, a substituted aryl group, or a heteroaromatic group, and

the substituent for said substituted group represents at least one group selected from the group consisting of a hydroxyl group, an alkoxy group, an alkylsulfonyl group, an arylsulfonyl group, an amide group, a carboxyl group, a cyano group, a sulfo group, a nitro group and an amino group;



(III)

wherein R^{31}, R^{32} and R^{33} each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group; R^{34} represents a hydroxyl group, a hydroxyamino group, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, a substituted or unsubstituted carbamoyl group, or a substituted or unsubstituted amino group; X^{31} represents —CO—, —SO_2—, or

and n^3 represents 0 or 1.

4,985,348

PROCESS FOR PHOTOGRAPHIC DEVELOPMENT PROCESSING

Mitsunori Hirano; Masato Hirano; Morio Yagihara, and Hisashi Okada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 6, 1989, Ser. No. 306,139

Claims priority, application Japan, Feb. 4, 1988, 63-24123

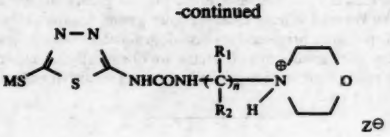
Int. Cl.[5] G03C 5/305

U.S. Cl. 430—434 **9 Claims**

1. A process for development-processing an image-wise exposed black-and-white silver halide light-sensitive material, comprising using a developer containing at least one compound represented by formula (I) or (II):

(I)

-continued



(II)

wherein

R_1 and R^2 each represents a hydrogen atom, an alkyl group or an aryl group;

M represents a hydrogen atom, an alkali metal atom, a quaternary ammonium salt, a quaternary phosphonium salt, an amidino group or a group capable of being converted to hydrogen or an alkali metal atom under alkaline conditions;

n represents an integer of 1 or more; and

$Z^{\ominus}$ represents an anion.

4,985,349

INFORMATION STORAGE MEDIUM

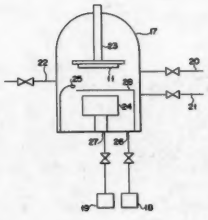
Kideki Ohkawa, Tokyo; Norio Ozawa, Kawasaki, and Motonari Matsubara, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 22, 1989, Ser. No. 454,956

Claims priority, application Japan, Dec. 26, 1988, 63-325871

Int. Cl.[5] G03C 1/492, 1/00, 11/00; B32B 3/02

U.S. Cl. 430—495 **10 Claims**



1. An information storage medium comprising:

a substrate; and

a phase-transformation type recording layer formed on the substrate, the recording layer containing Te, Ge, C and H,

wherein the recording layer is formed by a sputtering process with a Ge-Te alloy used as a target and with a mixed gas of a rare gas and a hydrocarbon gas used as a sputtering gas, the composition of the target being Ge_xTe_{100-x} (where x is expressed by atomic %, and $5 \leqq x \leqq 20$), the hydrocarbon content in the sputtering gas falling within a range of 5 to 35%.

4,985,350

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hideo Ikeda, and Shingo Ishimaru, both of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation of Ser. No. 199,189, May 26, 1988, abandoned. This application Jan. 25, 1990, Ser. No. 471,679

Claims priority, application Japan, Jun. 1, 1987, 62-137943

Int. Cl.[5] G03C 1/035

U.S. Cl. 430—567 **8 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon at least one silver halide light-sensitive emulsion layer, wherein at least one of a plurality of emulsions contained in said emulsion layer contains tabular grains having a thickness of less than 0.5 μm, a diame-

ter of at least 0.3 μm, and an average ratio of grain diameter to grain thickness of at least 2, said tubular grains occupy at least 50% of the entire projected area of all grains contained in said emulsion, the surfaces of said grains are chemically sensitized, and the ratio of surface sensitivity to internal sensitivity of said grains is 0.5 to 2.

4,985,351

PHOTOGRAPHIC RECORDING MATERIAL

Reinhart Matejec; Heinrich Odenwälder, both of Leverkusen; Hans Öhlschläger, Bergisch Gladbach, and Erich Wolff, Solingen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 25, 1989, Ser. No. 398,838

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1988, 3830512

Int. Cl.[5] **G03C** *1/10, 1/34*

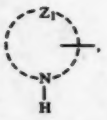
U.S. Cl. 430—598 **10 Claims**

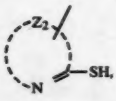
1. A color photographic silver halide material of the negative type, which contains at least one red-sensitive layer containing at least one cyan coupler, at least one green-sensitive layer containing at least one magenta coupler and at least one blue-sensitive layer containing a yellow coupler, in which at least one silver halide emulsion layer contains a compound corresponding to the following formula

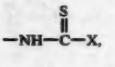
$$A—(Z)_n—F^* \qquad (I)$$

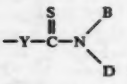
adsorbed on the silver halide grain,

A being a grain-active attachment group corresponding to formulae IIa to IId:


IIa


IIb


IIc


IId

Z_1 representing the remaining members for completing a preferably 5- or 6-membered ring which contains at least one other heteroatom, such as a nitrogen or sulfur atom,

Z_2 representing the remaining members for completing a preferably 5- or 6-membered ring,

X representing $—NH_2$, NHR,

$—NH—NH_2$, —NH—NHR, —SR,

Y representing —S—, —NH—, —NR—,

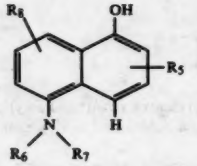
B and D representing hydrogen, R or, together, the remaining members of a 5- or 6-membered ring,

R representing an aliphatic, aromatic or heterocyclic radical,

Z representing a difunctional intermediate member,

n=0 or 1,

F* is a latent fogging agent group which becomes the active fogging agent (F) during color development corresponding the following formula IIIc



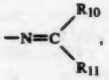
in which (one of the substituents R_5, R_6, R_7 and R_8 in formula IIIc being the point of attachment for the residue $A—(Z)_n—$,)

R_5 is hydrogen, —CONHR9, —NHCOR9, $—SO_2NHR_9$, —NHCOOR9, $—NHSO_2R_9$, —NHCONHR9,

R_6 is hydrogen or alkyl,

R_7 is hydrogen or acyl, such as —COR9, —COOR9, —CONHR9, SO_2NHR_3 or

R_6 and R_7 together represent the remaining members of a heterocyclic ring or, together with the nitrogen atom, represent an azomethine group



R_8 is hydrogen, alkoxy or acylamino,

R_8 and R_6 together represent the remaining members of a heterocyclic ring, which is condensed with the naphthol ring,

R_9 is an optionally substituted, aliphatic or olefinic, cycloaliphatic or cycloolefinic, aromatic or heterocyclic group,

R_{10} is hydrogen, alkyl, aryl, and

R_{11} is alkyl, aryl or hetaryl.

4,985,352

DNA ENCODING SEROTONIN 1C (5HT1C) RECEPTOR, ISOLATED 5HT1C RECEPTOR, MAMMALIAN CELLS EXPRESSING SAME AND USES THEREOF

David J. Julius; Richard Axel, and Thomas M. Jessell, all of New York, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation-in-part of Ser. No. 162,654, Feb. 29, 1988, abandoned. This application Jan. 18, 1989, Ser. No. 298,639

Int. Cl.[5] **C12Q** *1/68;* **C12M** *15/00;* **G01N** *33/566;* **C07H** *15/12*

U.S. Cl. 435—6 **17 Claims**

1. An isolated DNA molecule encoding a serotonin 5HT1C receptor.

4,985,353

METHOD FOR THE DIAGNOSIS OF WHOOPING-COUGH AND A TEST KIT FOR CARRYING THE METHOD INTO EFFECT

Hans B. O. Elving, Linköping, Sweden, assignor to Trion Forskning-Och Utvecklings Aktiebolag, Sollentuna, Sweden

PCT No. PCT/SE87/00588, § 371 Date Aug. 15, 1989, § 102(e) Date Aug. 15, 1989, PCT Pub. No. WO88/04693, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 10, 1987, Ser. No. 375,024

Claims priority, application Sweden, Dec. 16, 1986, 8605389-9

Int. Cl.[5] **G01N** *33/569;* **C12Q** *1/02, 1/04*

U.S. Cl. 435—7 **7 Claims**

1. A method for the diagnosis of whooping-cough, comprising

incubating a sample of body fluid from a patient with at least

a part of a pertussis toxin-sensitive, chromatophore containing a fish-scale during a predetermined suitable period of time said part of fish containing chromatophores;

subjecting said fish-scale to a first visual inspection, for color after addition of said sample;

adding an effective color inducing amount of catecholamine to said fish-scale;

subjecting said fish-scale to a second visual inspection, for color after the addition of catecholamine; and

comparing the fish-scale color first observed with the subsequently observed fish-scale color, the absence of a color change, or a slight color change, indicating the presence of pertussis toxin in the body fluid sample.

4,985,354

METHOD OF ASSAYING KALLIKREIN FORMATION SUBSTANCES

Yoshio Toyomaki; Katsumi Nishikawa, and Hitoshi Kawakubo, all of Hyogo, Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed Sep. 10, 1987, Ser. No. 95,821

Claims priority, application Japan, Sep. 10, 1986, 61-214959

Int. Cl.[5] C12Q *1/37, 1/56;* G12N *9/99*

U.S. Cl. 435—13 13 Claims

1. A method of assaying inhibitory action of a kallikrein formation inhibitor, the method comprising forming a reaction mixture consisting essentially of (1) animal plasma, (2) an activator for blood coagulation factor XII, (3) an electrolyte and (4) a kallikrein formation inhibitor to be assayed; incubating said reaction mixture; adding an inhibitor having substantially no effect upon the kallikrein activity and being capable of specifically inhibiting activity of activated blood coagulation factor XII to substantially stop production of kallikrein in said reaction mixture, said adding occurring while a substantially linear relationship exists between reaction time and kallikrein formation; and measuring an amount of kallikrein thus formed.

4,985,355

ETHANOL PRODUCTION BY ZYMOMONAS CULTURED IN YEAST-CONDITIONED MEDIA

Robyn J. Millichip, Lincoln, Nebr., assignor to University of Queensland, St. Lucia, Australia

Division of Ser. No. 257,073, Oct. 13, 1988, Pat. No. 4,885,241.

This application Oct. 2, 1989, Ser. No. 416,365

Int. Cl.[5] C12P *7/06, 7/14, 39/00*

U.S. Cl. 435—42 3 Claims

1. A composition containing a volume in excess of 1,000 gallons comprising fermenting carbohydrate containing medium with Zymomonas as the primary ethanol producing organism, yeast and Gram positive bacteria in an amount not inhibiting Zymomonas growth and fermentation, in the substantial absence of antibacterial agents, air and added yeast nutrients.

4,985,356

CLONING OF DNA ENCODING HUMAN MOTILIN PRECURSOR AND EXPRESSION OF THE PRECURSOR

Kiichi Sawai, Aichi; Jun Takeda, Kyoto; Yutaka Seino, Amagasaki; Hiroo Imura, Kyoto; Kenichi Tanaka, Nagoya; Haruo Takahashi, Nagoya; Takahiko Mitani, Nagoya, and Masayasu Kurono, Nagoya, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Aichi, Japan

Filed May 6, 1988, Ser. No. 190,849

Claims priority, application Japan, May 7, 1987, 62-109757

Int. Cl.[5] C12P *21/00, 19/34;* C12Q *1/68;* C12N *15/00*

U.S. Cl. 435—69.4 6 Claims

1. A cloned double-stranded DNA having a single strand of DNA comprising about 550 nucleotide sequences encoding a human motilin precursor.

4,985,357

PROCESS FOR THE SYNTHESIS OF GLYCERYL MONOMITRATES BY BIOCONVERSION OF NITROGLYCERINE

Eric P. Wimmer, Bergerac; Serge L. Lecolier, Janville sur Juine; Claire A. Ducrocq, Orsay; Claudine G. Servy, Palaiseau, and Maryse T. Lenfant, Gif sur Yvette, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Jan. 18, 1989, Ser. No. 298,035

Claims priority, application France, Jan. 20, 1988, 88 00603

Int. Cl.[5] C12R *1/645, 1/785, 1/90;* C12P *13/00*

U.S. Cl. 435—128 14 Claims

1. A process for the preparation of a glyceryl mononitrate or a mixture of glycerol mononitrates in a single step comprising a bioconversion step of nitroglycerine to glyceryl mononitrate or a mixture thereof by a microorganism selected from the group consisting of yeasts, fungi and protozoa.

4,985,358

METHOD FOR PROCESSING GLYCERIDE FATS AND OILS

Norio Sawamura, Hashimoto; Takaharu Matsuo, Sennan, and Yukio Hashimoto, Kishiwada, all of Japan, assignors to Fuji Oil Company, Ltd., Osaka, Japan

Filed Mar. 11, 1988, Ser. No. 167,240

Int. Cl.[5] C12P *7/64;* C11C *1/00, 3/00;* A23D *7/00*

U.S. Cl. 435—134 6 Claims

1. A process for processing glyceride fats and oils which comprises the steps of:

subjecting a mixture of a glyceride fat or oil and a monohydric alcohol fatty acid ester to an enzymatic ester interchange reaction;

distilling the reaction mixture of the ester interchange reaction to separate a distillate from a processed glyceride fat or oil to recover the latter;

subjecting the distillate to an esterification reaction to lower its acid value;

and recycling the distillate for use as a starting material for the ester interchange reaction.

4,985,359

VECTORS AND METHODS FOR THE CONSTRUCTION OF CDNA LIBRARIES

Ilse Oberbäumer, Burgfriedenstr. 8, D-8033 Krailling, Fed. Rep. of Germany, assignor to Ilse Oberbäumer, Krailling, Fed. Rep. of Germany

PCT No. PCT/EP86/00604, § 371 Date Jul. 23, 1987, § 102(e) Date Jul. 23, 1987, PCT Pub. No. WO87/02057, PCT Pub. Date Apr. 9, 1987

PCT Filed Sep. 25, 1986, Ser. No. 57,520

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534359

Int. Cl.[5] C12N *1/15, 1/21, 15/10, 15/64*

U.S. Cl. 435—172.3 11 Claims

1. A process for constructing a cDNA library comprising

a. linearizing a vector containing a polylinker by treatment with restriction endonuclease,

b. adding oligo(dC) or oligo(dG) tails to the 3′ ends,

c. adding dideoxynucleotide residues to the oligo(dC) or oligo(dG) tails,

d. removing one of the oligo(dC) or oligo(dG) tails at the 3′ end with a different restriction endonuclease,

e. adding an oligo(dT) tail to the free 3′ end,

f. hybridizing linearized vector molecules via the oligo (dT) tail of step (e) to the poly(A) tail of mRNA molecules of a mRNA population,

g. synthesizing double stranded cDNA from the mRNA molecules as template,

h. adding an oligo(dC) or oligo(dG) tail to one of said cDNA strands,

i. recircularizing said vector by annealing said oligo (dC) or oligo(dG) tail with a dideoxynucleotide-tailed comple-

mentary oligo(dG) or oligo(dC) tail on the other 3' end, and

j. transforming a microorganism with the vector of step (i).

4,985,360

NOVEL BILIRUBIN OXIDASE WHICH HAS A SUBSTRATE SPECIFITY TO BILIRUBIN, BUT NOT TO BILIVERDIN, CATECHOL AND HEMIN

Mamoru Takahashi; Shigeyuki Imamura, and Masaki Takada, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 10, 1988, Ser. No. 204,868

Claims priority, application Japan, Jun. 10, 1987, 62-144964

Int. Cl.[5] C12N *9/02, 1/00, 1/14;* **C12Q** *1/26*

U.S. Cl. 435—189 **7 Claims**

1. A bilirubin oxidase possessing a substrate specificity for bilirubin but not to biliverdin, catechol and hemin, said bilirubin oxidase catalyzing the enzyme reaction between two moles of bilirubin and one mole of oxygen to yield two moles of biliverdin and two moles of water, said bilirubin oxidase being in purified form.

4,985,361

HUMAN PANCREATIC ELASTASE

Yo Takiguchi; Tokio Tani; Ichiro Kawashima; Jun Ohsumi; Hidehiko Furukawa, and Toshinori Ohmine, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 846,934, Apr. 1, 1986, abandoned. This application Oct. 13, 1987, Ser. No. 111,094

Claims priority, application Japan, Apr. 5, 1985, 60-72308; Apr. 27, 1985, 60-91986; Jul. 26, 1985, 60-163964; Oct. 23, 1985, 60-236686

Int. Cl.[5] C12N *9/66;* **C12P** *21/06, 21/02, 21/04*

U.S. Cl. 435—218 **4 Claims**

1. A human elastase which comprises an amino acid sequence selected from the group consisting of human pancreatic elastase IIB, human pancreatic elastase IIIA, human pancreatic elastase IIIB, human pancreatic said amino acid sequences of human pancreatic elastase IIB, human pancreatic elastase IIIA, and human pancreatic elastase IIIB respectively being;

human pancreatic elastase IIB:

(N)-Cys Gly Val Ser Thr Tyr Ala Pro Asp Met
Ser Arg Met Leu Gly Gly Glu Glu Ala Arg
Pro Asn Ser Trp pro Trp Gln Val Ser Leu
Gln Tyr Ser Ser Asn Gly Gln Trp Tyr His
Thr Cys Gly Gly Ser Leu Ile Ala Asn Ser
Trp Val Leu Thr Ala Ala His Cys Ile Ser
Ser Ser Arg Ile Tyr Arg Val Met Leu Gly
Gln His Asn Leu Tyr Val Ala Glu Ser Gly
Ser Leu Ala Val Ser Val Ser Lys Ile Val
Val His Lys Asp Trp Asn Ser Asn Gln Val
Ser Lys Gly Asn Asp Ile Ala Leu Leu Lys
Leu Ala Asn Pro Val Ser Leu Thr Asp Lys
Ile Gln Leu Ala Cys Leu Pro Pro Ala Gly
Thr Ile Leu Pro Asn Asn Tyr Pro Cys Tyr
Val Thr Gly Trp Gly Arg Leu Gln Thr Asn
Gly Ala Leu Pro Asp Asp Leu Lys Gln Gly
Arg Leu Leu Val Val Asp Tyr Ala Thr Cys
Ser Ser Ser Gly Trp Trp Gly Ser Thr Val
Lys Thr Asn Met Ile Cys Ala Gly Gly Asp
Gly Val Ile Cys Thr Cys Asn Gly Asp Ser
Gly Gly Pro Leu Asn Cys Gln Ala Ser Asp
Gly Arg Trp Glu Val His Gly Ile Gly Ser
Leu Thr Ser Val Leu Gly Cys Asn Tyr Tyr
Tyr Lys Pro Ser Ile Phe Thr Arg Val Ser

-continued

Asn Tyr Asn Asp Trp Ile Asn Ser Val Ile
Ala Asn Asn-(C)

human pancreatic elastase IIIA:

(N)-Val Val His Gly Glu Asp Ala Val Pro Tyr
Ser Trp Pro Trp Gln Val Ser Leu Gln Tyr
Glu Lys Ser Gly Ser phe Tyr His Thr Cys
Gly Gly Ser Leu Ile Ala Pro Asp Trp Val
Val Thr Ala Gly His Cys Ile Ser Arg Asp
Leu Thr Tyr Gln Val Val Leu Gly Glu Tyr
Asn Leu Ala Val Lys Glu Gly Pro Glu Gln
Val Ile Pro Ile Asn Ser Glu Glu Leu Phe
Val His Pro Leu Trp Asn Arg Ser Cys Val
Ala Cys Gly Asn Asp Ile Ala Leu Ile Lys
Leu Ser Arg Ser Ala Gln Leu Gly Asp Ala
Val Gln Leu Ala Ser Leu Pro Pro Ala Gly
Asp Ile Leu Pro Asn Lys Thr Pro Cys Tyr
Ile Thr Gly Trp Gly Arg Leu Tyr Thr Asn
Gly Pro Leu Pro Asp Lys Leu Gln Gln Ala
Arg Leu Pro Val Val Asp Tyr Lys His Cys
Ser Arg Trp Asn Trp Trp Gly Ser Thr Val
Lys Lys Thr Met Val Cys Ala Gly Gly Tyr
Ile Arg Ser Gly Cys Asn Gly Asp Ser Gly
Gly Pro Leu Asn Cys Pro Thr Glu Asp Gly
Gly Trp Gln Val His Gly Val Thr Ser Phe
Val Ser Ala Phe Gly Cys Asn Phe Ile Trp
Lys Pro Thr Val Phe Thr Arg Val Ser Ala
Phe Ile Asp Trp Ile Glu Glu Thr Ile Ala
Ser His-(C)

or human pancreatic elastase IIIB

(N)-Val Val Asn Gly Glu Asp Ala Val Pro Tyr
Ser Trp Pro Trp Gln Val Ser Leu Gln Tyr
Glu Lys Ser Gly Ser Phe Tyr His Thr Cys
Gly Gly Ser Leu Ile Ala Pro Asp Trp Val
Val Thr Ala Gly His Cys Ile Ser Ser Ser
Arg Thr Tyr Gln Val Val Leu Gly Glu Tyr
Asp Arg Ala Val Lys Glu Gly Pro Glu Gln
Val Ile Pro Ile Asn Ser Gly Asp Leu Phe
Val His Pro Leu Trp Asn Arg Ser Cys Val
Ala Cys Gly Asn Asp Ile Ala Leu Ile Lys
Leu Ser Arg Ser Ala Gln Leu Gly Asp Ala
Val Gln Leu Ala Ser Leu Pro Pro Ala Gly
Asp Ile Leu Pro Asn Glu Thr Pro Cys Tyr
Ile Thr Gly Trp Gly Arg Leu Tyr Thr Asn
Gly Pro Leu Pro Asp Lys Leu Gln Glu Ala
Leu Leu Pro Val Val Asp Tyr Glu His Cys
Ser Arg Trp Asn Trp Trp Gly Ser Ser Val
Lys Lys Thr Met Val Cys Ala Gly Gly Asp
Ile Arg Ser Gly Cys Asn Gly Asp Ser Gly
Gly Pro Leu Asn Cys Pro Thr Glu Asp Gly
Gly Trp Gln Val His Gly Val Thr Ser Phe
Val Ser Ala Phe Gly Cys Asn Thr Arg Arg
Lys Pro Thr Val Phe Thr Arg Val Ser Ala
Phe Ile Asp Trp Ile Glu Glu Thr Ile Ala
Ser His-(C).

4,985,362

PROCESS OF PURIFYING TPA

Mitsuyoshi Morii; Masaharu Oboka, both of Yokohama; Toshihiko Suzuki, Tokyo; Katsuyuki Suzuki, Hiroshima; Nobuhiro Kawashima, Sagamihara; Noriko Morii, and Kunizou Mori, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed Sep. 17, 1987, Ser. No. 97,678

Claims priority, application Japan, Sep. 22, 1986, 61-222111

Int. Cl.[5] C12N *9/64, 9/50*

U.S. Cl. 435—226 **2 Claims**

1. A process for purifying tPA comprising the steps:

(a) contacting a carboxymethyl agarose exchange resin with

a crude tPA preparation containing tPA having a molecular weight of about 70,000 daltons, together with impure tPA species including active degradated products of tPA, polymers of tPA, and complexes of tPA with other proteins, said impure tPA species having molecular weights other than about 70,000 daltons and capable of reacting with an anti-human tPA antibody;

(b) treating said exchange resin with an eluant having a salt concentration of less than 0.15M and a pH in the range of 6.0–6.4 to elute the impure tPA species having molecular weights of less than about 70,000 daltons; and thereafter

(c) treating said exchange resin with an eluant having a salt concentration in the range of 0.175–0.375M and a pH in the range of 6.0–6.4 to elute the tPA having a molecular weight of about 70,000 daltons and recovering the resultant eluate.

4,985,363

MICROORGANISM CAPABLE OF GROWING IN 50% OR MORE ORGANIC SOLVENT

Akira Inoue, and Kouki Horikoshi, both of Tokyo, Japan, assignors to Research Development Corporation, Tokyo, Japan

Filed Mar. 3, 1988, Ser. No. 163,576

Claims priority, application Japan, Mar. 5, 1987, 62-48662; Mar. 5, 1987, 62-48663

Int. Cl.[5] C12N *1/26*; C12R *1/38, 1/40*

U.S. Cl. 435—253.3 **4 Claims**

1. A biologically pure culture of a microorganism which is characterized by being capable of growing in the presence of 50 v/v % or more of an organic solvent selected from the group consisting of aliphatic hydrocarbons, alicyclic hydrocarbons, aromatic hydrocarbons, alcohols, ethers and ketones, said microorganism being selected from the group consisting of *Pseudomonas putida* var. STM-603 (FERM BP-1751), *Pseudomonas* sp. STM-801 (FERM BP-1749) and *Pseudomonas* sp. STM-904 (FERM BP-1750).

4,985,364

PREPARATION OF CYCLOPROPANECARBOXYLIC ACIDS

Heinz Hildebrand, Wuppertal; Werner Zitzmann, Leverkusen; Dieter Arlt, and Heinz Kölbl, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

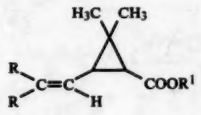
Filed May 6, 1985, Ser. No. 731,234

Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418374

Int. Cl.[5] C12P *41/00*; C12N *1/14*; C12R *1/70, 1/79*

U.S. Cl. 435—254 **11 Claims**

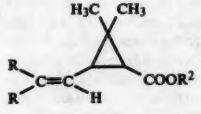
1. A process for the preparation of a (+)-trans-cyclopropanecarboxylic acid salt of the formula



in which

R is halogen or C_1–C_4-alkyl, and

R^1 is hydrogen or one equivalent of a metal ion, which comprises contacting a (±)-trans-cyclo-propanecarboxylic ester of the formula



in which

R^2 is methyl or ethyl,

with an esterase which is of microbial origin for a time and under conditions to effect hydrolysis, and isolating the resulting (+)-trans-cyclopropanecarboxylic acid.

4,985,365

PROCESS FOR PRODUCING OPTICALLY ACTIVE BENZYL ALCOHOL COMPOUND

Satoshi Mitsuda, Osaka; Noritada Matsuo, Hyogo, and Hideo Hirohara, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

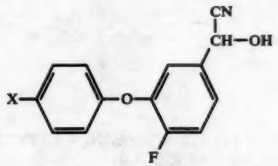
Continuation-in-part of Ser. No. 668,373, Oct. 1, 1984, abandoned, and a continuation-in-part of Ser. No. 443,756, Nov. 22, 1982, abandoned, and a continuation-in-part of Ser. No. 567,342, Dec. 30, 1983, abandoned. This application Jun. 3, 1988, Ser. No. 201,927

Claims priority, application Japan, Nov. 28, 1981, 56-191340; Jun. 2, 1982, 57-95207; Jan. 10, 1983, 58-002602; Jan. 10, 1983, 58-002604; Jan. 10, 1983, 58-002603; May 9, 1983, 58-081442

Int. Cl.[5] C12P *7/02*

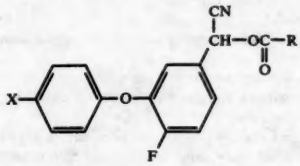
U.S. Cl. 435—280 **22 Claims**

1. The process for producing an (S)-isomer rich optically active α-cyano-benzyl alcohol compound represented by the Formula (II):



(II)

wherein X is a hydrogen atom, fluorine atom, chlorine atom or bromine atom, which process comprises asymmetrically hydrolyzing an ester of (R,S)-isomer of α-cyano-benzyl alcohol compound represented by the Formula I:



(I)

wherein X has the same meaning as above; R means a hydrogen atom, a C_1–C_{18} alkyl, C_2–C_{18} alkenyl, C_2–C_{18} alkynyl, C_1–C_4 halogen substituted alkyl, C_2–C_4 halogen-substituted alkenyl, C_1–C_8 alkoxyl, C_2–C_8 alkenyloxy or C_2–C_8 alkynyloxy, with an esterase orginating from microorganisms belonging to genus Arthrobacter, genus Alcalingenes, genus Achromobacter, genus Pseudomonas or genus Chromobacterium under conditions sufficient to convert the (R,S) isomer to an optically active mixture containing 73.2% or more of the (S)-isomer.

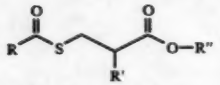
4,985,366

PROCESS FOR THE ENZYMATIC RESOLUTION OF THE OPTICAL ISOMERS OF RACEMIC ESTER DERIVATIVES OF 3-MERCAPTO-2-ALKYL-PROPIONIC ACID

Daniele Bianchi, Milan; Pietro Cesti, Trecate, and Paolo Golini, Turbigo, all of Italy, assignors to Montedison S.p.A, Italy

Filed May 30, 1989, Ser. No. 357,949
Claims priority, application Italy, Jun. 2, 1988, 20834 A/88
Int. Cl.[5] C12P 7/62
U.S. Cl. 435—280 14 Claims

1. Process for the enzymatic separation of the racemic mixture of the optical isomers of the compounds of formula (I):



(I)

wherein:

R, R' and R", independently of one another, represent a linear alkyl group of from C_1 to C_4, which process comprises a racemic compound substrate of formula (I) being reacted with an alcohol of formula (II):

R'"—OH (II)

wherein:

R'" represents a linear (C_1–C_8)-alkyl group in the presence of a lipase derived from microorganisms, which is capable of selectively causing the thio-transesterification of the (L)-isomer to take place, while leaving substantially unchanged the (D)-isomer of the compound of formula (I) used as the starting compound, which is then separated.

4,985,367

METHOD OF MANUFACTURING A LATERAL TRANSISTOR

Hideki Takada, Mountain View, Calif., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 170,663, Mar. 7, 1988, abandoned, which is a continuation of Ser. No. 889,737, Jul. 28, 1986, abandoned. This application Jul. 11, 1989, Ser. No. 379,675
Claims priority, application Japan, Sep. 2, 1985, 60-193479
Int. Cl.[5] H01L 21/265
U.S. Cl. 437—32 18 Claims

1. A method of manufacturing a lateral transistor comprising the steps of:

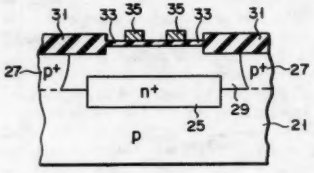
providing a semiconductor body of a first conductivity type;

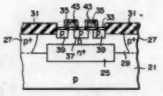
forming at least one annular pattern above a main surface of said semiconductor body;

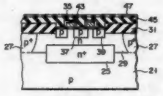
implanting an impurity of a second conductivity type in said semiconductor body using said pattern as a mask to form a first region of a second conductivity type in self-aligned fashion with respect to said annular pattern facing an inner peripheral wall of said annular pattern and a second region of a second conductivity type in self-aligned fashion with respect to said annular pattern facing an outer peripheral wall of said annular pattern;

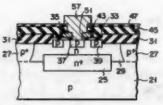
depositing at least one insulation layer on the resultant structure, with said annular pattern being retained;

etching said insulation layer to form a contact hole and, after said contact hole reaches said annular pattern, etching said insulation layer using said annular pattern as a mask to form in self-aligned fashion a contact hole reaching said first layer; and









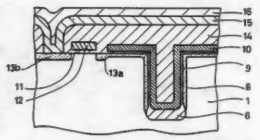
forming an electrode terminal in contact with said first region of said second conductivity type through said contact hole.

4,985,368

METHOD FOR MAKING SEMICONDUCTOR DEVICE WITH NO STRESS GENERATED AT THE TRENCH CORNER PORTION

Tatsuya Ishii; Yoshinori Okumura, and Masao Nagatomo, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 169,062, Mar. 17, 1988, Pat. No. 4,894,695. This application Oct. 31, 1989, Ser. No. 429,528
Claims priority, application Japan, Mar. 23, 1987, 62-69431
Int. Cl.[5] H01L 21/265, 29/78, 29/96
U.S. Cl. 437—038 22 Claims



1. A method for manufacturing a semiconductor device comprising the steps of

preparing a semiconductor substrate having a main surface, a predetermined impurity concentration of a first conductivity type and a trench with a large radius of curvature at at least a bottom corner portion thereof,

forming a two-layer film including an oxide film and a nitride film on the main surface of said semiconductor substrate, side portions of said trench and a portion of the bottom portion of the trench, and

forming a selective oxide film on the bottom portion of the trench and the corner portion thereof of said semiconductor substrate by oxidizing said semiconductor substrate with said two-layer film formed thereon, wherein

the direction of extension of an end portion of said selective oxide film overlying the corner portion changes from horizontal to vertically upward with a large radius of curvature.

4,985,369

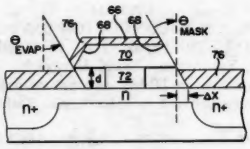
METHOD FOR MAKING SELF-ALIGNED OHMIC CONTACTS

Siang P. Kwok, Colorado Springs, Colo., assignor to Ford Microelectronics, Inc., Colorado Springs, Colo.

Continuation of Ser. No. 5,753, Jan. 21, 1987, abandoned. This application Sep. 2, 1988, Ser. No. 241,814

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—41 **14 Claims**



1. A method of making a semiconductor device having self aligned ohmic contacts comprising:

forming a channel region in a supporting substrate, adjacent to one surface thereof, said channel region containing a carrier concentration of a desired conductivity type;

depositing a layer of gate material on said one surface of said substrate, said layer of gate material overlaying and in electrical contact with said channel region;

forming a gate mask on the surface of said gate material, said gate mask having sidewalls disposed at an angle relative to said one surface of said supporting substrate, said angle being at least as great as the maximum angle of evaporative deposition of ohmic contact material onto said gate mask from a remote source;

delineating said gate material under said gate mask to form a gate;

selectively depositing said ohmic contact material onto said one surface of said supporting substrate from said remote source to form said ohmic contacts, said gate mask shielding an area on the surface of said substrate adjacent to said gate to prohibit said deposited ohmic contacts from making electrical contact with said gate.

4,985,370

METHOD OF MANUFACTURING SEMICONDUCTOR LASER DEVICE

Johannes J. Ponjee, and Rudolf P. Tijburg, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

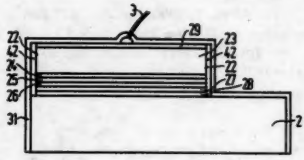
Division of Ser. No. 174,743, Mar. 29, 1988, Pat. No. 4,905,245. This application Dec. 13, 1989, Ser. No. 452,876

Claims priority, application Netherlands, Apr. 16, 1987, 8700904

Int. Cl.[5] H01L *21/20*

U.S. Cl. 437—129 **2 Claims**

1. A method of manufacturing a semiconductor laser device comprising coating surfaces of a semiconductor body for emanating a laser beam with a layer of an alkyl compound obtained by conversion of groups at the surfaces with a compound chosen from the group comprising silanes, said silanes being substituted with at least one alkyl group, and said at least one alkyl group being substituted with at least one fluorine atom, and carbonic acids with an alkyl group having at least seven carbon atoms, characterized in that the surfaces on which the



layer of the alkyl compound is formed are subjected to a cleaning treatment.

4,985,371

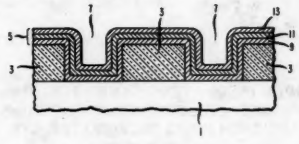
PROCESS FOR MAKING INTEGRATED-CIRCUIT DEVICE METALLIZATION

Virendra V. S. Rana, and Nun-Sian Tsai, both of South Whitehall Township, Lehigh County, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 9, 1988, Ser. No. 282,808

Int. Cl.[5] H01L *21/283*

U.S. Cl. 437—189 **25 Claims**



1. A method for making an integrated-circuit device which includes a dielectric, comprising forming a metallization on said dielectric, and forming said metallization comprising the steps of:

depositing a first metal layer,

forming on said first metal layer a grain-growth interrupting layer which is selected to cause renucleation of metal upon further metal deposition, and which is selected from the group consisting of conductive materials, materials which form intermetallic compounds with said metal, materials which form conductive alloys with said metal, and materials which are essentially eliminated upon subsequent metal deposition, and

depositing a second metal layer on said grain-growth interrupting layer, said second metal layer consisting essentially of the same metal as said first metal layer, second metal layer forming a renucleated metal layer, at least two grain-growth interrupting layers being deposited,

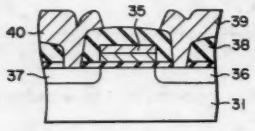
whereby the resistivity of said metallization is less than or equal three times the resistivity of a comparison metallization consisting essentially of the same metallization material and having been deposited without grain-growth interruption.

4,985,372

METHOD OF FORMING CONDUCTIVE LAYER INCLUDING REMOVAL OF NATIVE OXIDE

Tomonori Narita, Tokyo, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Feb. 9, 1990, Ser. No. 477,506
Claims priority, application Japan, Feb. 17, 1989, 1-37717
Int. Cl.[5] H01L *21/283, 21/336*
U.S. Cl. 437—192 9 Claims



5. A method for forming a gate electrode of a MOS type semiconductor device, comprising the steps of:

forming a gate oxide film on a surface of a semiconductor substrate;

forming a polycrystalline silicon layer on said gate oxide film;

performing dry etching of said surface of said polycrystalline silicon layer in a first chamber maintained in a nonoxidizing atmosphere, using a gas mixture of an N_2 gas and an NF_3 gas, to remove a natural oxide from said surface of said polycrystalline silicon layer;

transferring said substrate from said first chamber to a second chamber while the nonoxidizing atmosphere is maintained;

forming a refractory metal layer on said surface of said polycrystalline silicon layer by low-pressure CVD in said second chamber; and

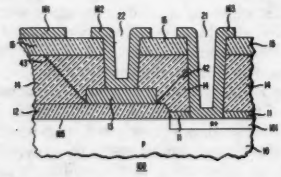
patterning said polycrystalline silicon layer and said refractory metal layer to form a gate electrode consisting essentially of said polycrystalline silicon layer and said refractory metal layer.

4,985,373

MULTIPLE INSULATING LAYER FOR TWO-LEVEL INTERCONNECTED METALLIZATION IN SEMICONDUCTOR INTEGRATED CIRCUIT STRUCTURES

Hyman J. Levinstein, Union; William D. Powell, Jr., Plainfield, both of N.J., and Ashok K. Sinha, Allentown, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 907,654, Sep. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 605,077, Apr. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 371,055, Apr. 23, 1982, abandoned. This application May 24, 1989, Ser. No. 357,647
Int. Cl.[5] H01L *21/443*
U.S. Cl. 437—195 11 Claims



1. A method of making an integrated circuit structure based on a silicon body including the system of:

(a) forming a first electrically conductive region overlying a top surface of the body;

(b) forming a first insulating region of essentially silicon dioxide, containing a first concentration of phosphorus, overlying the first conductive region;

(c) treating an upper surface of the first insulating region to form a substantially planar upper surface thereof;

(d) depositing a second insulating region of essentially silicon dioxide and of substantially uniform thickness upon the substantially planar upper surface of the first insulating region, whereby at least a portion of an upper surface of the second insulating region is substantially planar, the first insulating region containing a concentration of phosphorus which is higher than that of the second insulating region; and

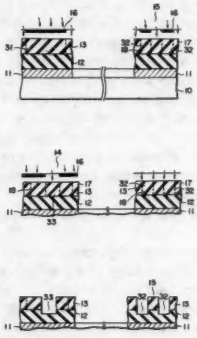
(e) forming a second electrically conductive region upon a portion of the upper surface of the second insulating region.

4,985,374

MAKING A SEMICONDUCTOR DEVICE WITH AMMONIA TREATMENT OF PHOTORESIST

Hitoshi Tsuji, Yokohama; Hiroshi Haraguchi, Tokyo; Osamu Hirata, Kawasaki, and Hidetsuna Hashimoto, Kitakyushu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 27, 1990, Ser. No. 544,374
Claims priority, application Japan, Jun. 30, 1989, 1-169052; Jun. 30, 1989, 1-169053
Int. Cl.[5] H01L *21/47*
U.S. Cl. 437—229 16 Claims



1. A manufacturing method of semiconductor device comprising:

a first step of exposing a periphery of a first region of a photoresist layer coating an insulating layer formed on a semiconductor substrate and a periphery of a second region for positioning;

a second step of heating said photoresist layer in ammonia atmosphere and forming an alkali insoluble portion in a periphery of said first region and that of said second region;

a third step of exposing a third region, which is smaller than said first region, and said second region and developing these regions;

a fourth step of etching said third region and said second region to a predetermined depth; and

a fifth step of repeating said third and fourth steps once or more in a region, which is smaller than said third region, and said second region.

4,985,375

GLASS-CERAMIC ARTICLE AND METHOD FOR ITS PRODUCTION

Chikao Tanaka; Setsuro Ito, both of Yokohama; Yasumasa Nakao, Tokyo, and Kei Maeda, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed May 4, 1988, Ser. No. 190,071
Claims priority, application Japan, May 7, 1987, 62-109639
Int. Cl.[5] C03C *10/02, 10/04*
U.S. Cl. 501—5 2 Claims

1. A glass-ceramic article produced by crystallizing an admixture consisting essentially of from 45 to 53% by weight SiO_2, from 14 to 17% by weight of Al_2O_3, from 1 to 5% by weight of B_2O_3, from 11 to 16% by weight of MgO, from 3 to 6% by weight of CaO, from 5 to 8% by weight of ZnO, from 7 to 11% by weight of TiO_2, from 0 to 2% by weight of $Li_2O+Na_2O+K_2O$ and from 0 to 1% by weight of Zro_2.

4,985,376

CONDUCTIVE PASTE COMPOSITIONS AND CERAMIC SUBSTRATES

Kazuo Sunahara; Tsuneo Ichimatsu, and Yumiko Aoki, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Jan. 19, 1990, Ser. No. 467,510
Claims priority, application Japan, Jan. 31, 1989, 1-19830
Int. Cl.[5] C03C *8/14, 8/18, 8/22, 8/10*
U.S. Cl. 501—22 4 Claims

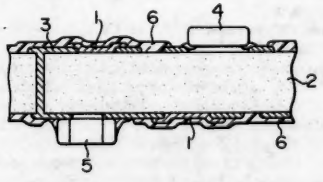
1. A surface conductive paste composition to be applied to the surface of a green sheet for a ceramic substrate or to the surface of a ceramic substrate after being fired and to be then fired, the solid content of which has a composition comprising from 88 to 99% by weight of Au powder, from 1 to 12% by weight of crystallized glass frit and from 0 to 11% by weight of non-crystallized glass frit, provided that the total of the crystallized glass frit and the non-crystallized glass frit is at most 12% by weight. and which has a lead compound powder incorporated in an amount of from 0.05 to 3% by weight based on the total amount of said composition.

4,985,377

GLAZE RESISTOR

Takeshi Iseki, Osaka; Osamu Makino, Hirakata; Mitsuo Ioka, Moriguchi, and Hirotoshi Watanabe, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 7, 1988, Ser. No. 281,025
Claims priority, application Japan, Dec. 14, 1987, 62-315899
Int. Cl.[5] C03C *31/155*
U.S. Cl. 501—51 9 Claims



1. A glaze resistor comprising a ceramic substrate and a conductive component, comprising 4.0 to 70.0 wt% of a metal silicide and a metal boride and 30.0 to 96.0 wt% of a glass; the weight ratio of the metal boride to the metal silicide being from 1:99 to 68:32 .

4,985,378

CARBON-CONTAINING REFRACTORY AND A MANUFACTURING METHOD THEREFOR

Kenji Ichikawa, Bizen; Noboru Tsukamoto, Sanyo; Eishi Iida, Bizen; Yuji Yoshimura, Bizen, and Junichi Inoue, Bizen, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1988, Ser. No. 240,278
Claims priority, application Japan, Sep. 21, 1987, 62-234795
Int. Cl.[5] C04B *35/56*
U.S. Cl. 501—89 3 Claims

1. A method for preparing a carbon-containing refractory comprising:

(i) mixing 1–10 weight % of silicon nitride, 1–35 weight % of carbon, and a remainder of a refractory raw material selected from the group consisting of sintered alumina, electrofused alumina, synthetic mullite, clay minerals, fused silica, zirconia sand, stabilized zirconia, zirconia mullite, alumina zirconia, and quartzite to form a mixture;

(ii) molding said mixture into a molded body; and

(iii) burning said molded body in a non-oxidizing atmosphere having a nitrogen partial pressure of at most 0.2 atmospheres at a temperature of at least 1300° C., to obtain fine whiskers of silicon carbide uniformly distributed within said refractory.

4,985,379

STABILIZED METALLIC OXIDES

Terence A. Egerton, 52 Fairwell Road; Edmund J. Lawson, 12 Branksome Grove, both of Stockton on Tees, Cleveland, and Peter W. Frost, 15 Fitzroy Square, London W1, all of England

Division of Ser. No. 136,435, Dec. 17, 1987, Pat. No. 4,820,593, which is a continuation of Ser. No. 905,139, Sep. 9, 1986, abandoned. This application Dec. 21, 1988, Ser. No. 287,661
Claims priority, application United Kingdom, Oct. 1, 1985, 8524140
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[5] C04B *35/48;* B05D *7/100*
U.S. Cl. 501—104 10 Claims

1. A method of manufacturing a solid ceramic body which comprises

a. mixing an aqueous dispersion of zirconia particles, said particles having a diameter of less than or equal to 0.5 microns with

(i) a water-soluble hydrolyzable salt of zirconium in an amount of from 0.2 to 5 mole % calculated as ZrO_2 based on moles of zirconia particles and

(ii) a water-soluble hydrolyzable salt selected from the group consisting of water-soluble salts of yttrium in an amount of from 0.5 to 7 mole % calculated as Y_2O_3 based on moles of zirconia particles and water-soluble salts of calcium, magnesium, strontium and cerium in an amount of from 2 to 10 mole % expressed as oxide based on moles of zirconia particles;

b. precipitating a hydrous oxide of zirconium and a hydrous oxide of yttrium, calcium, magnesium, strontium or cerium onto the zirconia particles; and

c. forming the coated zirconia particles into a shaped body and firing said body of particles to form a solid ceramic body.

4,985,380

METHOD OF MAKING THIN REFRACTORY FLAKES

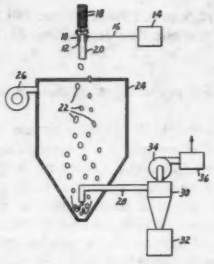
David K. Douden, Richfield, Minn., assignor to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed Apr. 17, 1989, Ser. No. 339,472
Int. Cl.[5] C04B *35/02;* C03C *12/00*
U.S. Cl. 501—128 18 Claims

1. A method for making thin refractory flakes, comprising the sequential steps of

(a) forming a sol of metal oxide and a surfactant,

(b) continuously forming bubbles of said sol having an average diameter of greater than about 1 cm, said bubbles having sufficiently thin wall thicknesses to allow breakage thereof upon contact with a solid surface,
(c) drying said bubbles,



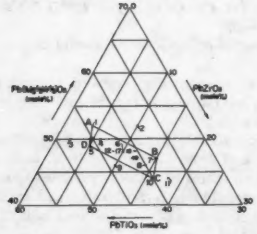
(d) collecting and breaking said dried bubbles into fragments, and
(e) firing said fragments to provide thin refractory flakes having an average thickness of less than 2 μm.

4,985,381

DIELECTRIC CERAMIC COMPOSITION

Yoshiaki Mori, Nagaokakyo; Masaru Fujino, Takatsuki; Hiroshi Takagi, Otsu, and Yukio Sakabe, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 21, 1990, Ser. No. 483,052
Claims priority, application Japan, Feb. 23, 1989, 1-44730
Int. Cl.[5] C04B *35/46, 35/48*
U.S. Cl. 501—136 **2 Claims**



1. A dielectric ceramic composition consisting essentially of a basic composition of a ternary system, $Pb(Mg_{\frac{1}{3}}W_{\frac{1}{3}})O_3-PbTiO_3-PbZrO_3$, and 0.05 to 6.5 wt% of an antireducing agent incorporated therein, said basic composition comprising a main component represented by the general formula:

$$xPb(Mg_{\frac{1}{3}}W_{\frac{1}{3}})O_3-PbTiO_3-zPbZrO_3$$

wherein x, y and z are mole percentages of the respective components, and 0.3 to 2.0 wt% of ZnO contained therein as an additive, said main component having a composition falling within the area of a polygon ABCD defined by points A(52.0, 44.0, 4.0), B(47.0, 38.0, 15.0), C(44.0, 40.0, 16.0), D(49.0, 46.0, 5.0) in the FIGURE, said antireducing agent having a composition expressed by the general formula:

$$\alpha Li_2O+\beta RO+\gamma B_2O_3+(1-\alpha-\beta-\gamma)SiO_2$$

wherein RO is at least one oxide selected from the group consisting of BaO, CaO, SrO and MgO, α, β and γ are mole fractions of the respective components and take each value within the following respective ranges, $0<\alpha<0.2$, $0.1\leqq\beta<0.55$, $0<\gamma<0.4$.

4,985,382

IMPROVED CERAMIC COMPOSITE STRUCTURE COMPRISING DROSS

S. K. Nadkarni, Jonquiere, and Narasimha S. Raghavan, Kingston, both of Canada, assignors to Lanxide Technology Company, LP, Newark, Del.

Division of Ser. No. 907,935, Sep. 16, 1986. This application Oct. 31, 1989, Ser. No. 429,818
Int. Cl.[5] C04B *35/10, 35/36, 35/58*
U.S. Cl. 501—155 **14 Claims**

1. A self-supporting ceramic composite body produced by a method comprising the steps of:
(a) providing at least one comminuted dross material as at least a portion of a permeable mass of filler material, said dross material being obtained from a metal melting operation;
(b) orienting a parent metal and said permeable mass of filler material containing dross relative to each other so that formation of an oxidation reaction product will occur in a direction towards and into said permeable mass of filler material; and
(c) heating said parent metal to a temperature above its melting point but below the melting point of said oxidation reaction product to form a body of molten parent metal and reacting the molten parent metal with at least one oxidant at said temperature to form said oxidation reaction product, and at said temperature maintaining at least a portion of said oxidation reaction product in contact with and extending between said body of molten metal and said at least one oxidant, to draw molten metal through the oxidation reaction product towards said at least one oxidant and towards and into the permeable mass of filler material containing dross so that fresh oxidation reaction product continues to form within the permeable mass of filler material containing dross at an interface between said at least one oxidant and previously formed oxidation reaction product, and continuing said reacting for a time sufficient to infiltrate at least a portion of said permeable mass of filler material containing dross with said oxidation reaction product.

4,985,383

PROCESS FOR REMOVING METALLIC CORROSION PRODUCTS FROM A CONTAMINATED CATALYST SOLUTION PRODUCED ON CARBONYLATION OF METHANOL AND/OR METHYL ACETATE AND/OR DIMETHYL ETHER

Heinz Erpenbach, Cologne; Winfried Lork, Erftstadt; Andreas Seidel, Cologne, and Peter Prinz, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 26, 1990, Ser. No. 470,945
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 3903909
Int. Cl.[5] B01J *38/68, 31/40*; C07C *51/54, 51/12*
U.S. Cl. 502—24 **6 Claims**

1. A process for removing metallic corrosion products from a contaminated catalyst solution produced on carbonylation of methanol, methyl acetate, dimethyl ether or mixtures thereof, the contaminated catalyst solution containing 0.5–15% by weight of carbonyl complexes of noble metals, 20–70% by weight of quaternary organo-phosphorous compounds as organic promotors, 2–15% by weight of metallic corrosion products and 13–75% by weight of acetic acid, acetic anhydride, and ethylidene diacetate, which comprises treating the catalyst solution with water to precipitate the noble metal carbonyl complex while the organic promotor and the metallic corrosion products remain in solution, separating the aqueous phase from the precipitated noble metal carbonyl complex and ex-

tracting the organic promotor from the aqueous phase using C_4–C_8 alkanols, recovering the promotor by evaporating the extractant, recombining the promotor with the precipitated noble metal carbonyl complex and recycling it as a catalyst solution into the process after addition of acetic acid, acetic anhydride or mixtures thereof, and purging the aqueous phase from the metallic corrosion products.

4,985,384

CRACKING CATALYSTS HAVING AROMATIC SELECTIVITY

Jean-Pierre Gilson, Columbia, Md., assignor to W. R. Grace & Co-Conn., New York, N.Y.

Filed Aug. 25, 1986, Ser. No. 899,572
Int. Cl.[5] B01J *29/28*
U.S. Cl. 502—61 11 Claims

1. An FCC catalyst comprising spray dried particles having a particle size less than about 200 micrometers of a zeolite Beta containing about 0.1 to 15 wt % based on the weight of the zeolite Beta of a metal selected from the group consisting of Ga, Zn and mixtures thereof.

4,985,385

METHOD OF PREPARING A CATALYST PRECURSOR COMPRISED OF CALCINED NICKEL-ALUMINUM FEITKNECHT COMPOUND/NON-CALCINED ALUMINO-SILICATE CLAY/ALKALINE EARTH AND/OR REAR EARTH METAL COMPOUND

Alan Williams, West Midlands; John D. Wilson, Essex; Roger D. Wragg, West Midlands; Stephen D. Jones, Worcester; Costa Komodromos, and Timothy J. Reynolds, both of London, all of England, assignors to British Gas plc, London, England

Filed Sep. 25, 1989, Ser. No. 412,298
Claims priority, application United Kingdom, Sep. 23, 1988, 8822469
Int. Cl.[5] B01J *21/16*
U.S. Cl. 502—84 31 Claims

1. A method of preparing a catalyst precursor comprising intimately mixing a Feitknecht compound with a non-calcined alumino-silicate clay mineral to form a mixture and adding at least one stabilising additive for reducing silicon-species loss, said additive comprising an alkaline earth and/or rare earth metal compound, and thereafter calcining the resulting mixture to produce a calcined reaction product forming the catalyst precursor.

4,985,386

CARBURIZED PLATINUM CATALYSTS AND PROCESS FOR PREPARING THE SAME EMPLOYING ACID AMINE SALTS

Kazunori Tsurumi, Tokyo; Toshihide Nakamura, Funabashi, and Akira Sato, Misato, all of Japan, assignors to Tanaka Kikinzoku Kogyo K.K., Japan

Filed Feb. 17, 1989, Ser. No. 312,684
Claims priority, application Japan, Feb. 18, 1988, 63-36248
Int. Cl.[5] B01J *23/42, 21/18, 27/22;* H01M *4/88*
U.S. Cl. 502—185 8 Claims

1. A process for preparing a platinum catalyst comprising a carbon support and the at least partially carburized alloy of (i) platinum and of (ii) one or more metals selected from the group consisting of nickel, cobalt, chromium and iron, supported on the carbon support, comprising:

immersing the carbon support into a solution containing a platinum containing ion;

reducing the platinum containing ion to platinum by a reducing agent to be deposited onto the carbon support;

adding a solution containing the organic acid amine salt or salts of one or more metals selected from the group consisting of nickel, cobalt, chromium and iron, to the carbon support;

reducing the said salt or salts to the corresponding selected metals by low temperature treatment under reducing conditions to minimize crystal growth; and

alloying catalytically active quantities of said platinum and said one or more selected metals; and at least partially carburizing the resulting alloy by carbon produced by high temperature treatment with carbon monoxide, carbon dioxide or lower hydrocarbons.

4,985,387

CATALYST SUPPORTS/CATALYSTS FOR THE TREATMENT OF VEHICULAR EXHAUST GASES

Michel Prigent, Rueil Malmaison; Gilbert Blanchard, Le Plessis Belleville; Francois Garreau, Paris, and Philippe Courty, Houilles, all of France, assignors to Pro-Catalyse, Rueil Malmaise Cedex, France

Filed Mar. 16, 1989, Ser. No. 324,456
Claims priority, application France, Mar. 16, 1988, 88 03385
Int. Cl.[5] B01J *21/04, 23/10, 23/40*
U.S. Cl. 502—304 25 Claims

1. A catalyst support which comprises an inert, rigid substrate coated with a layer of porous material, said porous material comprising alumina, at least one rare earth oxide, and a spinel type compound having a specific surface of at least 50 m^2/g.

4,985,388

CATALYTIC EXHAUST PIPE INSERT

William A. Whittenberger, Garrettsville, Ohio, assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jun. 29, 1989, Ser. No. 373,241
Int. Cl.[5] B01J *32/00, 35/02*
U.S. Cl. 502—439 20 Claims

1. A catalytic assembly for insertion into an exhaust pipe comprising a noncorrodible metal from adapted to fit within said pipe, and a catalyst-containing thin metal strip wrapped about said form and secured thereto at each end thereof.

4,985,389

POLYSULFIDE TREATED MOLECULAR SIEVES AND USE THEREOF TO REMOVE MERCURY FROM LIQUEFIED HYDROCARBONS

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 102,958, Sep. 30, 1987, Pat. No. 4,877,515.
This application Oct. 30, 1989, Ser. No. 428,819
Int. Cl.[5] B01J *27/02*
U.S. Cl. 502—516 11 Claims

1. A process for preparing a molecular sieve absorbent comprising:

(a) drying a molecular sieve at a temperature of between about 350° and about 450° C. in an anhydrous nonreactive atmosphere;

(b) contacting said molecular sieve with an aqueous solution of water soluble alkali polysulfide until said molecular sieve is saturated with said aqueous solution; and

(c) drying said saturated molecular sieve of (b) at a temperature between about 10° and about 75° C. and a pressure of less than about 500 millimeters of mercury to deposit said water soluble alkali polysulfide onto said molecular sieve without decomposing the water soluble alkali polysulfide.

4,985,390

THERMOSENSITIVE RECORDING MEDIUM

Norihiko Nakashima; Yoshiji Kanoh; Atsushi Suzuki, and Sadashi Ueda, all of Wakayama, Japan, assignors to Kao Corporation, Chuo, Japan

Filed Apr. 11, 1989, Ser. No. 336,127
Claims priority, application Japan, Apr. 26, 1988, 63-103112
Int. Cl.[5] B41M *5/18*
U.S. Cl. 503—208 4 Claims

1. A thermosensitive recording medium which comprises a

substrate and a thermosensitive, coloring layer provided on the substrate, said thermosensitive coloring layer comprising

a binder,

a colorless or light-colored electron-donating dye,

an electron-accepting compound to react with said electron-donating dye to form a coloring matter and

an ester compound obtained from a fatty acid having 20 to 28 carbon atoms and a straight or cyclic alcohol, said ester having a melting point of 50 to 100 degrees C. and at least one non-phenolic hydroxy group.

4,985,391

HEAT-SENSITIVE RECORDING MATERIAL

Kenji Ikeda; Ken Iwakura, and Masanobu Takashima, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

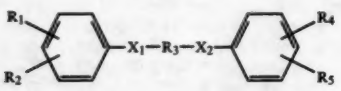
Continuation of Ser. No. 11,806, Feb. 6, 1987. This application Jun. 6, 1989, Ser. No. 362,133

Claims priority, application Japan, Feb. 6, 1986, 61-24493

Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—208 **6 Claims**

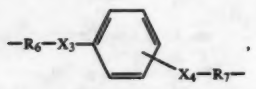
1. A heat-sensitive recording material comprising a support having provided thereon a heat-sensitive color forming layer containing an electron donating dye precursor and an electron accepting compound, said heat-sensitive color forming layer contains (1) at least one compound selected from the group consisting of (a) an aromatic polyether and (b) an aromatic polyester, and (2) an aromatic ether, wherein said aromatic ether is other than said aromatic polyether, and wherein said aromatic polyether and aromatic polyester is selected from the group consisting of compounds represented by formula (I):



(I)

wherein R_1, R_2, R_4 and R_5 may be the same or different, and each represents hydrogen, alkyl, alkoxy, aryloxy, acyl, halogen, cyano, aryl, alkyloxycarbonyl or aryloxycarbonyl, wherein the pair R_1 and R_2 and the pair R_4 and R_5 each may combine and form a ring structure;

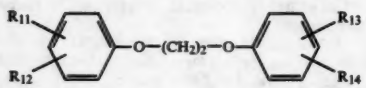
R_3 represents an alkylene group having 1 to 5 ether bonds or ester bonds and having from I to 10 carbon atoms, or represents



wherein R_6 and R_7 each represents an alkylene group having from 1 to 8 carbon atoms, X_3 and X_4 each represents —O— or —S—; and

X_1 and X_2 may be the same or different and each represents —O—, —S— or

and wherein said aromatic ether is selected from the group consisting of compounds represented by formula (III):



(III)

wherein R_{11}, R_{12}, R_{13} and R_{14} are defined the same as R_1 above, wherein the pair R_{11} and R_{12} and the pair R_{13} and R_{14} each may combine and form a ring structure.

4,985,392

COLORED THERMOGRAPHIC MEDIA

Jon A. Bjork, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 21, 1989, Ser. No. 342,105

Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—211 **20 Claims**

1. An intensely colored thermographic medium comprising a substrate having on at least one surface thereof a coating comprising:

(a) a substantially transparent film-forming binder,

(b) an organic solvent soluble catechol in solid solution in said binder,

(c) substantially insoluble microparticles of a metal salt dispersed throughout said binder, and

(d) at least one colorant dispersed throughout said binder in an amount sufficient to provide said thermographic medium with a maximum background reflectance of less than about 70% at any and all wavelengths within the range of from 400 nm to 700 nm; wherein said metal salt and said catechol are unreactive at room temperatures but react to form a near infrared absorbing complex upon the application of heat.

4,985,393

HEAT SENSITIVE RECORDING MATERIAL

Fumio Seyama, Osaka; Tetsuo Tsuchida, Takarazuka, and Mitsuru Kondo, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

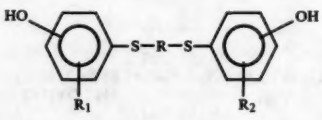
Filed Dec. 11, 1989, Ser. No. 448,419

Claims priority, application Japan, Dec. 12, 1988, 63-313269; Jan. 11, 1989, 1-4132

Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—216 **10 Claims**

1. A heat sensitive recording material comprising a substrate and a heat sensitive recording layer thereon incorporating a colorless or light-colored basic dye and a color acceptor reactive with the dye to form a color when contacted therewith, the recording material being characterized in that, as the color acceptor is used at least one compound of the formula [I]



(I)

wherein R is an alkylene group having at least one bond selected from the group consisting of ester bond and amido bond in the main chain, R_1 and R_2 are each hydrogen atom, alkyl, cycloalkyl, alkenyl, alkoxyl, hydroxyl or halogen atom.

4,985,394

THERMOSENSITIVE RECORDING MATERIAL

Yasutomo Mori, Numazu, and Norio Kurisu, Susono, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 13, 1989, Ser. No. 450,238

Claims priority, application Japan, Dec. 28, 1988, 63-331020

Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—226 **6 Claims**

1. A thermosensitive recording material comprising: (a) a substrate, (b) a thermosensitive coloring layer comprising a leuco dye and a color developer capable of inducing color formation in said leuco dye, formed on the substrate, and (c) a protective layer comprising (i) at least one inorganic pigment selected from the group consisting of silica and calcium car-

bonate, each having an average particle diameter of 0.1 μm or less, and (ii) a water-soluble binder, formed on said thermosensitive coloring layer.

4,985,395

DYE-DONOR ELEMENT FOR THERMAL DYE SUBLIMATION TRANSFER

Luc J. Vanmaele, Lochristi, and Christian C. Van de Sande, Belsele, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

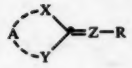
Filed Feb. 23, 1990, Ser. No. 483,765

Claims priority, application European Pat. Off., Feb. 24, 1989, 89200465

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **9 Claims**

1. Dye-donor element for use according to thermal dye sublimation transfer comprising a support having thereon a dye layer containing a binder and a dye corresponding to general formula (I)



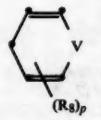
(I)

wherein

X and Y each independently represent C═O, C═S, SO_2, C═U with U a group derived from an electronegative active methylene group;

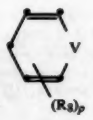
A represents the atoms necessary to complete a 5- or 6-membered unsubstituted or substituted ring including such ring with an aromatic nucleus fused-on;

Z represents N or CR_2 wherein R_2 represents H, CN, $COOR_1''$, $NR_5'R_6'$, OR_7', SR_7', or an electronegative active methylene group, wherein R_1'' represents hydrogen or an unsubstituted or substituted alkyl group or an unsubstituted or substituted aryl group and wherein R_5' and R_6' each independently represent hydrogen, an unsubstituted or substituted alkyl group or an unsubstituted or substituted aryl group or R_5' and R_6' may be combined together with the nitrogen to which they are attached to form a heterocyclic ring system and wherein R_7' represents hydrogen or an unsubstituted or substituted alkyl group or an unsubstituted or substituted aryl group, or R_2 may be combined with R so that Z—R represents



wherein V represents O, S, Se, Te, NR_9 wherein R_9 represents hydrogen, an unsubstituted or substituted alkyl group, an unsubstituted or substituted aryl group or an amino group, and wherein R_8 represents an unsubstituted or substituted alkyl group or an unsubstituted or substituted aryl group, and wherein p represents 1, 2, 3 or 4 (when p equals 2, 3 or 4 the R_8 groups may be the same or different);

R represents Ar—NR_3R_4, Ar'—N═N—Ar—NR_3R_4, Het—N═N—Ar—NR_3R_4, Het—N═CR_2'—NR_5R_6 or Ar—$(OR_7)_m$, wherein Ar and Ar' each independently represent an unsubstituted or substituted aryl nucleus including fused aromatic nuclei and wherein Het represents an unsubstituted or substituted 5-membered or 6-membered heterocyclic ring and wherein R_3 and R_4 each independently represent hydrogen, an unsubstituted or substituted alkyl group or an unsubstituted or substituted aryl group or R_3 and R_4 may be combined together with the nitrogen to which they are attached to form a heterocyclic ring system or R_3 and/or R_4 may be combined with Ar to form a heterocyclic ring system and wherein R_2' has one of the significations given for R_2 and wherein R_5 and R_6 have one of the significations given for R_5' and R_6' and wherein R_7 has one of the significations given for R_7' and wherein m represents 1, 2 or 3 (when m equals 2 or 3 the R_7 groups may be the same or different), or R may be combined with R_2 (in case Z is CR_2) so that Z—R represents



wherein V represents O, S, Se, Te, NR_9 wherein R_9 represents hydrogen, an unsubstituted or substituted alkyl group, an unsubstituted or substituted aryl group or an amino group, and wherein R_8 represents an unsubstituted or substituted alkyl group or a unsubstituted or substituted aryl group, and wherein p represents 1, 2, 3 or 4 (when p equals 2, 3 or 4 the R_8 groups may be the same or different).

4,985,396

DYE TRANSFER TYPE THERMAL PRINTING SHEETS

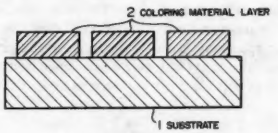
Tetsuji Kawakami, Katano; Akihiro Imai; Nobuyoshi Taguchi, both of Ikoma; Yukichi Murata, Sagamihara, and Takao Hirota, Machida, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd and Mitsubishi Kasei Corporation, Osaka, both of, Japan

Filed Dec. 22, 1988, Ser. No. 288,139

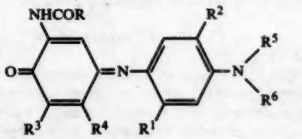
Claims priority, application Japan, Dec. 29, 1987, 62-334576

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **2 Claims**



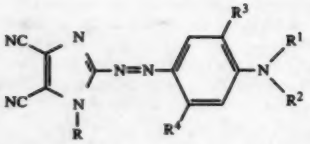
1. A dye transfer type thermal printing sheet wherein the coloring material layers contain either of at least one dye represented by the formula (I)



(I)

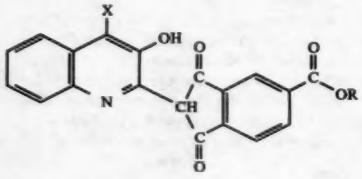
wherein R^1 represents a hydrogen atom or a methyl group, R^2 represents a hydrogen atom, R^3 represents a hydrogen atom or a halogen atom, R^4 represents a hydrogen atom or a methyl group and R^5 and R^6 each represents an alkyl group of 1–4 carbon atoms, at least one dye represented by the formula (II)

(II)



wherein R represents an allyl group or an alkyl group of 1–4 carbon atoms, R^1 and R^2 each represents an alkyl group of 1–4 carbon atoms, R^3 represents a hydrogen atom and R^4 represents a methyl group or an acetylamino group, and at least one dye represented by the formula (IV)

(IV)



wherein X represents a hydrogen atom and R represents an alkyl group of 1–12 carbon atoms or an alkoxyalkyl group of 3–8 carbon atoms.

4,985,397

THERMAL IMAGE TRANSFER RECORDING SYSTEM

Hiroyuki Uemura, Numazu; Akira Suzuki, Mishima; Masaru Shimada, Shizuoka; Hidehiro Mochizuki, and Naoya Morohoshi, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 405,480, Sep. 12, 1989. This application Jul. 26, 1990, Ser. No. 558,296

Claims priority, application Japan, Oct. 3, 1988, 63-249458; Jul. 31, 1989, 1-200098; Oct. 12, 1989, 1-265799

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **16 Claims**

1. A thermal image transfer recording system, comprising:

a sublimation type thermal image transfer recording medium in combination with an image receiving medium comprising a substrate and a dye receiving layer formed thereon, said dye receiving layer comprising, as the principal components, (1) a vinyl chloride-based resin containing active hydrogens and (2) an isocyanate compound.

4,985,398

THERMAL TRANSFER DYESHEET

Nicholas C. Beck, Manningtree; Peter A. Gemmell, and Richard A. Hann, both of Ipswich, all of Great Britain, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 8, 1989, Ser. No. 433,783

Claims priority, application United Kingdom, Nov. 11, 1988, 8826455

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **7 Claims**

5. A method for making a coloured thermal transfer print with protection against ultraviolet radiation-induced fading, by holding a transfer coat of a dyesheet against a dye-receptive surface of a receiver and carrying out a thermal transfer process comprising heating selected areas of the dyesheet to transfer dye to corresponding areas of the dye-receptive surface; and for multicolour prints repeating the transfer process onto the same dye-receptive surface with transfer coats containing different coloured thermal transfer dyes; is characterised by carrying out a further thermal transfer process onto the same dye receptive surface using a transfer coat in which the thermally transferable material is a colourless absorber of ultraviolet radiation.

4,985,399

THERMAL DYE TRANSFER PRINTING SYSTEMS, THERMAL PRINTING SHEETS, AND DYE RECEIVING SHEETS

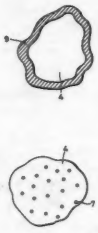
Hiromu Matsuda, Osaka; Nobuyoshi Taguchi; Akihiro Imai, both of Ikoma, and Keiichi Yubakami, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 889,076, Jul. 24, 1986, Pat. No. 4,902,669. This application Nov. 6, 1989, Ser. No. 432,718

Claims priority, application Japan, Jul. 24, 1985, 60-163411; Jul. 24, 1985, 60-163413; Jul. 24, 1985, 60-163414; Jul. 24, 1985, 60-163415

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **12 Claims**



1. A dye transfer sheet for thermal transfer printing which comprises a substrate and a dye carrier layer formed on said substrate, said dye carrier layer being made of a dispersion of at least one sublimable dye and lubricating particles in a resin binder, said lubricating particles projecting from a surface level of said dye carrier layer, and said lubricating particles having individually an outer layer of a lubricating material thereon or a lubricating material dispersed therein.

4,985,400

PROCESS FOR PRODUCING SUPERCONDUCTIVE CERAMICS BY ATOMIZATION OF ALLOY PRECURSER UNDER REACTIVE ATMOSPHERES OR POST ANNEALING UNDER OXYGEN

Alok Choudhury, Püttlingen, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Sep. 7, 1989, Ser. No. 404,185

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1989, 3921127

Int. Cl.[5] H01B *12/02;* **H01L** *39/12*

U.S. Cl. 505—1 **11 Claims**

1. Process for producing superconductive ceramics comprising:

melting a prealloy in the desired concentration ratio from the metal components of the substance system used and forming an intermediate product from the alloy melt by applying a rapid solidification technique, comprising:

a. bringing the melt to a temperature at which it is chemically homogeneous;

b. atomizing the melt brought to this temperature to a powder by means of inert gas;

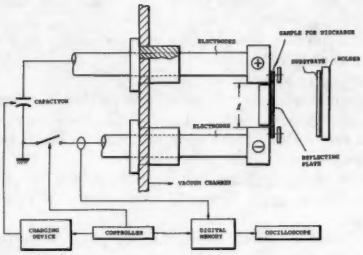
c. baking the powder under oxygen atmosphere so as to produce oxide powder.

4,985,401

METHOD FOR PRODUCING A SUPERCONDUCTOR OF AN IMMISCIBLE ALLOY AND ITS OXIDE

Akira Sawaoka, Kanagawa; Ryuichi Matsuda, Tokyo, and Tadashi Kondo, Aichi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 24, 1989, Ser. No. 315,162
Claims priority, application Japan, Feb. 25, 1988, 63-40665
Int. Cl.[5] H01B *12/00*
U.S. Cl. 505—1 19 Claims



1. A method for producing a superconductivity comprising: subjecting a composite body comprising constituents of an immiscible alloy to electric discharge explosion flame spraying thereby depositing an alloy on a substrate, and oxidizing the resultant alloy.

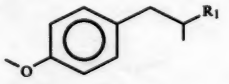
4,985,402

2-METHYL-1-NITRILO-2-METHYL -1-HYDROXYLAMINO-3-(METHOXYPHENYL) PROPANE, ORGANOLEPTIC USES THEREOF AND PROCESSES FOR PREPARING SAME

Anubhav P. S. Narula, Hazlet, and De Virgilio John J., Freehold, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 25, 1990, Ser. No. 514,514
Int. Cl.[5] A61K *7/46*
U.S. Cl. 512—6 10 Claims

1. At least one 2-methyl-1-nitrilo- or 2-methyl-1-hydroxylamino-3-(methoxyphenyl) propane.

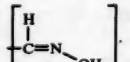


wherein R_1 is a nitrogen-containing moiety selected from the group consisting of:

(i) cyanide having the structure:

and

(ii) hydroxylaminomethyl having the structure:



4. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, perfumed articles and perfumed polymers comprising the step of intimately admixing with said consumable material an aroma augmenting or enhancing quantity of at least one compound defined according to claim 1.

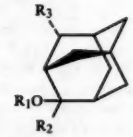
4,985,403

USE OF ADAMANTANE DERIVATIVES IN AUGMENTING OR ENHANCING THE AROMA OF CONSUMABLE MATERIALS

Anubhav P. S. Narula, Hazlet; Charles E. J. Beck, Summit, and Marie R. Hanna, Keyport, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 261,275, Oct. 21, 1988, Pat. No. 4,956,481. This application Jun. 29, 1990, Ser. No. 545,623
Int. Cl.[5] A61K *7/46*
U.S. Cl. 512—19 7 Claims

1. A process for augmenting or enhancing the aroma of a perfume composition cologne or perfumed article comprising the steps of adding to said perfume composition, cologne or perfumed article an aroma augmenting or enhancing amount of the adamantane derivatives having the structure:



wherein R_1 is hydrogen or acetyl; R_2 is hydrogen or methyl; R_3 is hydrogen or methylene; and the dashed line is a carbon hydrogen single bond or a carbon-methylene double bond with the provisos that when R_2 is methyl, R_1 and R_3 are hydrogen and when R_2 is hydrogen, R_3 is methylene and the dashed line is a carbon-methylene double bond.

4,985,404

PROLONGED RELEASE OF BIOLOGICALLY ACTIVE POLYPEPTIDES

James W. Mitchell, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 787,873, Oct. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 657,713, Oct. 4, 1984, abandoned. This application Jun. 29, 1988, Ser. No. 212,763
Int. Cl.[5] A61K *37/14, 33/24, 33/30;* C07K *13/00*
U.S. Cl. 514—6 14 Claims

1. A somatotropin-containing particulate for use in a parenteral release formulation having biological compatibility with a porcine animal comprising the reaction product of a porcine somatotropin and ions of a metal selected from the group consisting of zinc, iron, calcium, bismuth, barium, magnesium, manganese, aluminum, copper, cobalt, nickel and cadmium which are present in the reaction product in an amount up to about 2% by weight sufficient to prolong the release of the somatotropin from the formulation.

4,985,405

THERAPEUTIC PRODUCT BASED ON ORGANIC SILICON DERIVATIVES

Jean Gueyne; Marie-Christine Seguin, both of Perigord 1, 6 Lacets Saint-Leon, Monte-Carlo, Monaco, and Jean-Georges Henrotte, 11 Rue de la Ferronnerie, 75001 Paris, France

Filed Feb. 3, 1988, Ser. No. 151,925
Claims priority, application France, Feb. 6, 1987, 87 01446
Int. Cl.[5] A61K *37/00, 37/02, 37/16*
U.S. Cl. 514—008 15 Claims

1. A therapeutic product, comprising an aqueous solution containing an organic silicon derivative selected from the group consisting of silanol, polysilanol and organosiloxane and (b) a compound selected from the group consisting of protide and non-phenolic amino acid and pharmaceutically acceptable

salts thereof, the ratio of (a) to (b) being 0.25 to 2 atoms of silicon per free or combined carboxylic acid group in said compound.

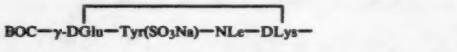
4,985,406

PEPTIDES DERIVED FROM CCK8, THEIR PREPARATION AND THE PHARMACEUTICAL COMPOSITIONS WHICH CONTAIN THEM

Bruno Charpentier, L'Hay Les Roses, and Bernard P. Roques, Saint Maurice, both of France, assignors to Institut National de la Sante et de La Recherche Medicale (INSERM), France

Filed Feb. 29, 1988, Ser. No. 162,410
Claims priority, application France, Mar. 2, 1987, 87 02770
Int. Cl.[5] A61K *37/02*; C07K *7/54*
U.S. Cl. 514—11 2 Claims

1. The peptide which is



2. A pharmaceutical composition useful in the treatment of conditions of the central nervous system in which a disfunction of the dopaminergic pathways occurs comprising:

a pharmaceutically effective amount of a compound as defined in claim 1, in free form or in the form of an addition salt with a pharmaceutically acceptable acid or base, in combination with one or more diluents or adjuvants that are compatible and pharmaceutically acceptable.

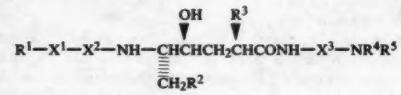
4,985,407

DIPEPTIDE COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Michael W. Foxton, Chalfont St. Giles; Barry E. Ayres, Ickenham, and Anthony W. J. Cooper, Northolt, all of England, assignors to Glaxo Group Limited, England

Filed Dec. 6, 1988, Ser. No. 280,330
Claims priority, application United Kingdom, Dec. 7, 1987, 8728561
Int. Cl.[5] C07K *5/06*
U.S. Cl. 514—19 20 Claims

1. Compounds of formula (I)



wherein:

R^1 represents an acyl group;

X^1 is selected from phenylalanine and p-methoxyphenylalanine bonded N-terminally to R^1 and C-terminally to X^2;

X^2 is selected from histidine and N-methylhistidine bonded N-terminally to X^1 and C-terminally to the group —NH—;

R^2 represents a C_{4-6} cycloalkyl group;

R^3 represents a group CHR^6R^7 (where R^6 is a hydrogen and R^7 is phenyl, or R^6 is methyl and R^7 is selected from hydrogen, methyl and ethyl;

X^3 represents a C_{2-6} alkylene chain optionally substituted by one or more C_{1-4} alkyl groups;

R^4 and R^5, which may be the same or different, each independently is selected from hydrogen and C_{1-4} alkyl group, or NR^4R^5 forms a 5- or 6-membered polymethylenimine ring;

and physiologically acceptable salts and solvates thereof.

4,985,408

PHARMACEUTICAL COMPOSITION FOR TREATING AND PREVENTING CARDIOVASCULAR DISEASE

Yaguang Liu, 30 Seaman Ave., New York, N.Y. 10034

Division of Ser. No. 910,240, Sep. 22, 1986, Pat. No. 4,906,470.
This application Dec. 13, 1989, Ser. No. 449,746
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—25 1 Claim

1. A process for producing Puerarin and derivatives of Puerarin comprising:

a. extracting ground roots of a plant selected from the group consising of *Pueraria lobata* (willd) Ohwi and *Pueraria thomsanii* Benth with 90% ethanol;

b. concentrating the resulting ethanol extract to a syrup under reduced pressure;

c. drying the syrup at 70 degree C.;

d. chromatographing said dried syrup on alumina to separate ten bands including a band containing crystal Puerarin and derivaties thereof with water saturated butanol as a developing solvent;

e. recovering said band with butanol-pyridine;

f. concentrating the butanol-pyridine solution to form crystals;

g. recrystallizing said crystals of Purarin and derivatives thereof from 50% ethanol; and

h. Recovering said crystals of Purarin and derivatives thereof from 50% ethanol.

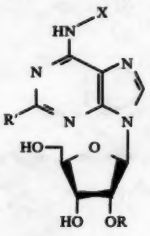
4,985,409

ADENOSINE DERIVATIVES AND PHARMACEUTICAL COMPOSITION THEREOF

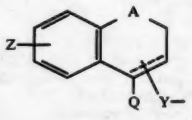
Toshio Yamada, and Ken-ichi Kageyama, both of Hyogo, Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jan. 9, 1990, Ser. No. 462,246
Claims priority, application Japan, Jan. 11, 1989, 1-5658
Int. Cl.[5] A61K *31/70*; C07H *19/167*
U.S. Cl. 514—46 4 Claims

1. An adenosine compound of the formula (I):



wherein R is a C_{1-3} alkyl group; R' is hydrogen or a C_{1-3} alkyl group; X is a C_{3-8} cycloalkyl group, a C_{1-4} alkyl group having one or two hydroxy groups, a C_{1-3} group havine one or two phenyl groups, a bicycloheptyl group, a C_{1-3} alkyl group having a naphthyl group, a C_{1-3} alkyl group having an acenaphthylenyl group, or a group of the formula (II) or (III);



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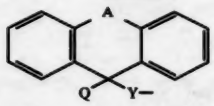


(III)

wherein Z is hydrogen, a hydroxy group or a C_{1-3} alkoxy group, Q is hydrogen or a hydroxy group, A is $—CH_2—$, —O—, —S— or shows a direct connection; Y is $—(CH_2)_n—$ or shows a direct connection; n is an integer of 1 to 3; and the broken line represents the presence or absence of a second bond, or a pharmaceutically acceptable salt thereof.

4. A method for treating hypertension in a mammal which comprises administering to the mammal an anti-hypertensive effective amount of at least one adenosine compound or pharmaceutically acceptable salt thereof of claim 1.

4,985,410

QUATERNARY AMMONIUM SALTS OF POLYSACCHARIDES, PROSSESSING HYPOCHOLESTEROLEMIC ACTIVITY

Franco Conti, Milan, Italy, assignor to Etablissement Texcontor, Vaduz, Liechtenstein

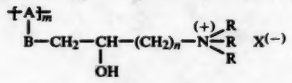
Continuation of Ser. No. 801,323, Nov. 25, 1985, abandoned. This application May 2, 1988, Ser. No. 189,247

Claims priority, application Italy, Aug. 14, 1985, 21937 A/85

Int. Cl.[5] A61K *31/715, 31/72, 31/73*

U.S. Cl. 514—54 **13 Claims**

1. A method of eliciting a hypocholesterolemic effect in a human subject, which comprises orally administering to said subject a hypocholesterolemically effective amount of a quaternary ammonium salt of the formula



wherein A represents the monomer unit of a natural polysaccharide selected from the group consisting of tragacanth, guar gum, carob gum, starch, tamarind and chitosan;

m is a whole number between 100 and 1,000;

n is a whole number between 0 and 4;

B is selected from the group consisting of O, S, NH and NR;

R is a linear alkyl radical of from 1 to 4 carbon atoms; and

X represents a pharmacologically-acceptable anion; and

wherein the degree of substitution on the polysaccharide is between 0.5 and 2.

4,985,411

DIALKYL-SUBSTITUTED DITHIANES AND PESTICIDAL COMPOSITIONS

John E. Casida, Berkeley, Calif., and Michael Elliott, Aston, England, assignors to The Wellcome Foundation Ltd., London, England and The Regents of the University of California, Calif.

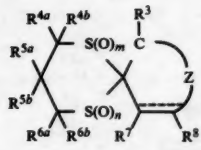
Filed Nov. 29, 1989, Ser. No. 442,629

Claims priority, application United Kingdom, Nov. 30, 1988, 8827886

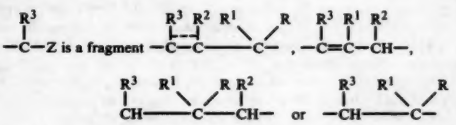
Int. Cl.[5] A01N *43/32; C07D 339/08*

U.S. Cl. 514—63 **9 Claims**

1. A compound of the formula (I):



wherein m and n are independently selected from 0, 1 or 2,



R is selected from hydrogen, methyl or ethyl; R^1 is selected from C_{1-4} hydrocarbyl substituted by one to five halo atoms, and a group $—C{\equiv}C—R^9$ wherein R^9 is a group $S(O)_w—R^{10}$ wherein R^{10} is trifluoromethyl, methyl or ethyl and w is 0, 1 or 2 or n is a C_{3-5} aliphatic group or an aliphatic group containing up to 5 carbon atoms substituted by C_{1-4} alkoxy, C_{2-6} alkoxyalkoxy, C_{1-8} acyloxy, halo or hydroxy, a group COR^{11} wherein R^{11} is hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy or a group $NR^{12}R^{13}$ wherein R^{12} and R^{13} are independently selected from hydrogen, methyl or ethyl, or R^9 is $SiR^{14}R^{15}R^{16}$ wherein R^{14} to R^{16} are the same or different and each is a C_{1-4} aliphatic group or R^{14} and R^{15} are C_{1-4} aliphatic groups and R^{16} is a phenyl group; R^2, R^3, R^7 and R^8 are independently selected from hydrogen, methyl or halo; R^{4a} and R^{4b}, R^{6a} and R^{6b} are independently selected from hydrogen, C_{1-3} alkyl, C_{2-3} alkenyl or alkynyl or C_{1-3} alkyl, C_{2-3} alkenyl or alkynyl each substituted by halo, cyano or C_{1-4} alkoxy; cyano, halo or a group COR^{11a} wherein R^{11a} is hydrogen, C_{1-4} alkoxy, C_{1-4} alkyl or a group $NR^{12a}R^{13a}$ wherein R^{12a} and R^{13a} are independently selected from hydrogen, methyl or ethyl; R^{5a} is a non-aromatic hydrocarbyl group containing up to seven carbon atoms, or phenyl or a non-aromatic hydrocarbyl group containing up to seven carbon atoms or phenyl each substituted by cyano, halo, C_{1-4} alkyl, C_{1-4} haloalkyl, C_{3-4} cycloalkyl, C_{1-4} alkoxy or a group $S(O)_qR^{17}$ wherein q is 0, 1 or 2 and R^{17} is methyl or ethyl and R^{5b} is hydrogen, hydroxy, C_{1-4} alkyl or C_{1-4} alkyl substituted by alkoxy; and represents —CH—CH— or —C═C—.

9. A method for the control of pests comprising application to the pest or to an environment susceptible to pest infestation of a pesticidally effective amount of a compound according to claim 1.

4,985,412

PHOSPHORIC ACID ESTER, PROCESS FOR PREPARING THE SAME, AND DETERGENT COMPOSITION CONTAINING THE SAME

Akira Matsunaga, Wakayama; Junya Wakatsuki, Utsunomiya; Nobutaka Horinishi; Takashi Imamura, both of Wakayama, and Tomihiro Kurosaki, Ennan, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Oct. 21, 1988, Ser. No. 260,868

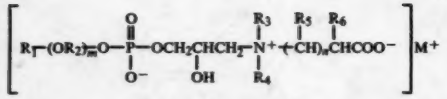
Claims priority, application Japan, Oct. 21, 1987, 62-265989

Int. Cl.[5] C07F *9/09, 9/10*

U.S. Cl. 514—70 **3 Claims**

1. A phosphoric acid ester represented by the following formula (I):

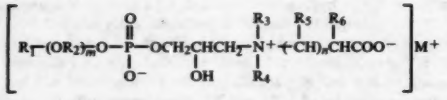
(I)



wherein R_1 represents a linear or branched, alkyl or alkenyl group having a C_{8-36} carbon atom content, with or without the hydrogen atom(s) being substituted with fluorine atom(s), or a phenyl group with substituted linear or branched alkyl group(s) having a C_{1-15} carbon atom content, R_2 represents an alkylene group having a C_{2-3} carbon atom content, R_3 and R_4 independently denote a hydrogen atom or an alkyl group having a C_{1-3} carbon atom content, R_5 and R_6 independently denote a hydrogen atom, or an alkyl, alkenyl, or phenyl group with or without the hydrogen atom(s) being substituted with group(s) containing hetero atom(s) excepting for a mercapto group, m is an integer of 0–30, n is an integer of 0–5, M is a hydrogen atom, an alkali metal, an alkali earth metal, an ammonium group, an alkyl amine group, or an alkanol amine group.

2. A detergent composition comprising a phosphoric acid ester represented by the following formula (I):

(I)



wherein R_1 represents a linear or branched, alkyl or alkenyl group having a C_{8-36} carbon atom content, with or without the hydrogen atom(s) being substituted with fluorine atom(s), or a phenyl group with substituted linear or branched alkyl group(s) having a C_{1-15} carbon atom content, R_2 represents an alkylene group having a C_{2-3} carbon atom content, R_3 and R_4 independently denote a hydrogen atom or an alkyl group having C_{1-3} carbon atom content, R_5 and R_6 independently denote a hydrogen atom, or an alkyl, alkenyl, or phenyl group with or without the hydrogen atom(s) being substituted with group(s) containing hetero atom(s), excepting for a mercapto group, m is an integer of 0–30, n is an integer of 0–5, M is a hydrogen atom, an alkali metal, an alkali earth metal, an ammonium group, an alkyl amine group, or an alkanol amine group and at least one member selected from the group consisting of other anionic or nonionic surface active agents, water, nonaqueous solvents, coloring agents, inorganic salts, organic salts, viscosity adjusting agents, perfumes, biocidal agents, chelating agents, forming promoting agents, antiseptics, and moisturizing agents.

4,985,413

POISON BAIT FOR CONTROL OF NOXIOUS INSECTS

Takuji Kohama; Fumiyasu Minagawa; Goro Shinjo, all of Toyonaka, and Kazuyuki Maeda, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 4, 1988, Ser. No. 164,108

Claims priority, application Japan, Mar. 6, 1987, 62-52497

Int. Cl.[5] A01N *57/00, 57/18, 47/10, 37/34, 25/00*

U.S. Cl. 514—79 **19 Claims**

1. A bait composition for the control of noxious insects which comprises (a) at least one insecticide selected from the group consisting of organic phosphorous insecticides, carbamate insecticides and pyrethroid insecticides, (b) crystalline cellulose, (c) crop product powders, (d) an essential oil, and (e) a saccharide, wherein the components (a), (b), (c), (d) and (e) are contained respectively in amounts of 0.05 to 5.0% by weight, 20.0 to 60.0% by weight, 11.3 to 79.0% by weight, 0.1 to 10.0% by weight, and 10.0 to 40.0% by weight based on the total weight of the composition and the composition is n a tablet form.

4,985,414

1-NAPHTHOLPHTHALEIN MONOPHOSPHATES AND DIAGNOSTIC REAGENTS CONTAINING THEM

Werner Guethlein, Mannheim, and Hartmut Merdes, Heidelberg, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

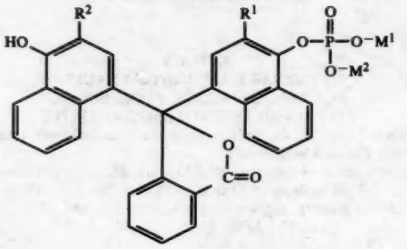
Filed Nov. 18, 1988, Ser. No. 273,403

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 3739284

Int. Cl.[5] C07C *9/06, 9/28;* **A01N** *57/00;* **A61K** *31/665*

U.S. Cl. 514—100 **7 Claims**

1. 1-Naphtholphthalein monophosphates of the formula



wherein

each of R^1 and R^2 is hydrogen or halogen, and

each of M^1 and M^2 is a proton or an alkali metal, alkaline earth metal, ammonium, dicyclohexylammonium, tetraalkylammonium or alkanolammonium cation,

and the tautomeric transformation products thereof.

4,985,415

PESTICIDAL THIONOPHOSPHONIC ACID(AMIDE) ESTERS

Herbert Sommer, Remscheid; Dieter Arlt, Cologne; Jürgen Hartwig, Leverkusen; Bernhard Homeyer, Leverkusen, and Hans-Detlef Matthaei, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

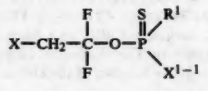
Filed Mar. 23, 1989, Ser. No. 327,650

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811004

Int. Cl.[5] A01N *9/36;* **C07F** *9/02*

U.S. Cl. 514—118 **13 Claims**

1. An O-(1,1-difluoro-2-halogeno-ethyl) halogenothionophosphonate of the formula



in which

R^1 stands for C_1–C_4-alkyl or C_2–C_4-alkenyl each of which is optionally substituted by halogen,

R^2 stands for C_1–C_4-alkoxy, C_2–C_4-alkenyloxy or C_2–C_4-alkinyloxy each of which is optionally substituted by halogen and/or C_1–C_4-alkoxy, or for the group

in which

R^3 stands for C_1–C_4-alkyl which is optionally substituted by halogen and/or C_1–C_4-alkoxy; for cycloalkyl which has 3 to 8 carbon atoms and which is optionally substituted by methyl, ethyl, fluorine and/or chlorine; or for C_2–C_4-alkenyl or C_2–C_4-alkinyl, each of which is optionally substituted by halogen, methyl and/or ethyl, and

X and X^{1-1} each independently stands for halogen.

12. A method of combating pests which comprises applying to such pests or to a pest habitat a pesticidally effective amount of a compound according to claim 1.

4,985,416

PLATINUM COMPLEXES OF AZODIAZONIUM DYES AS ANTI-TUMOR AGENTS

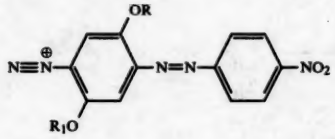
Beverly A. Teicher, Needham, Mass., assignor to Dana Farber Cancer Institute, Inc., Boston, Mass.

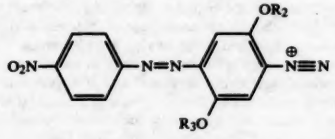
Filed Mar. 13, 1989, Ser. No. 322,768

Int. Cl.[5] C07C *245/20*; A61K *31/655*

U.S. Cl. 514—150 **6 Claims**

1. The method of increasing the susceptibility of tumor cells in a mammal to killing by exposure to radiation or heat which comprises injecting into said mammal a composition comprising (1) a complex having the composition





in which R, R_1, R_2, and R_3 are lower alkyl groups having 1–5 carbon atoms, together with 92) a pharmacologically acceptable non-toxic carrier therefor.

4,985,417

TREATMENT OF GLAUCOMA

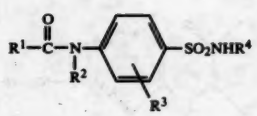
Seymour F. Trager, 14 Sherwood Dr., Plainview, N.Y. 11803, and G. Michael Blackburn, 23 Crimicar La., Sheffield, United Kingdom S10 4FA

Filed May 2, 1989, Ser. No. 346,495

Int. Cl.[5] A61K *31/18*; C07D *207/08*; C07B *45/04*

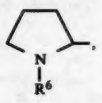
U.S. Cl. 514—155 **33 Claims**

12. Method of treatment of glaucoma in a mammal, comprising administering to the mammal an effective amount of an active, water-soluble carbonic anhydrase inhibitor having the formula:



or a pharmaceutically acceptable salt thereof, wherein

R^1 is selected from the group consisting of NH_2CH_2—, —CH(Me)NH_2, —CH(NH_2)$CHMe_2$, —CH(NH_2)CH_2CHMe_2, —CH(NH_2)CH(Me)CH_2Me, R^6NHCHR^5—,



and $R^6NHCH_2CHR^5$—;

R^2 is selected from the group consisting of H, alkyl having from 1 to 6 carbon atoms, alkenyl having from 2 to 6 carbon atoms, and cycloalkyl;

R^3 is selected from the group consisting of H, Cl, Br, F, —CF_3, —OCH_3, —NO_2, alkyl having from 1 to 6 carbon atoms and alkenyl having from 2 to 6 carbon atoms;

R^4 is selected from the group consisting of H, —OH, —NH_2, —CN and —OCH_3;

R^5 is a naturally occurring alpha amino acid side chain;

R^6 is selected from the group consisting of H, HCO—, CH_3CO—, $PhCH_2OCO$— and XCH_2CO— wherein Ph is phenyl and X is chlorine or bromine,

and stereoisomers thereof.

4,985,418

PHARMACEUTICAL COMPOSITIONS

David A. Richards, Cambridge, United Kingdom, assignor to Glaxo Group Limited, England

Filed Dec. 23, 1987, Ser. No. 137,169

Claims priority, application United Kingdom, Dec. 24, 1986, 8630913

Int. Cl.[5] A61K *31/56*

U.S. Cl. 514—179 **8 Claims**

1. A pharmaceutical composition comprising an effective amount of fluticasone propionate to treat bowel disease in a human or animal subject in tablet or capsule from, characterized in that said tablet or capsule has an enteric coating.

4,985,419

PHENOTHIAZINE DERIVATIVES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Claude Garret, Fontenay sous Bois; Claude Guyon, Saint Maur Des Fosses; Bernard Plau, Fresnes, and Gerard Taurand, Creteil, all of France, assignors to Rhone-Poulenc Sante, France

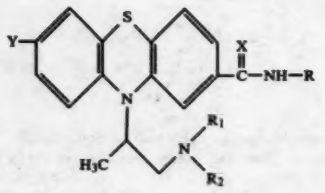
Filed Jun. 12, 1989, Ser. No. 364,465

Claims priority, application France, Jun. 10, 1988, 88 07771

Int. Cl.[5] A61K *31/54*, *31/55*; C07D *279/24*, *417/06*

U.S. Cl. 514—211 **9 Claims**

1. A phonothiazine of the formula:



in which Y denotes hydrogen or halogen and R_1 and R_2, which may be identical or different, each denote alkyl, cycloalkylalkyl, hydroxyalkyl or acetyloxyalkyl or form, together with the nitrogen atom to which they are attached, a pyrrolidinyl, piperidinyl, perhydroazepinyl or dihydropyrrolyl which may be substituted by 1 or 2 alkyl hydroxyalkyl or acetyloxyalkyl radicals, and -either X denotes oxygen, sulphur or :N-R_4, in which R_4 is hydrogen or cyano, and R denotes 4- to 6-membered cycloalkyl or phenyl, or —CH_2R_3, in which R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl or alkynyl or 2 to 4 carbon atoms, 3- to 6-membered cycloakyl, or phenyl which is unsubstituted or substituted (by 1 or 2 halogen atoms or by a hydroxy, alkyl, alkyloxy, trifluoromethyl or nitro), or furyl, thienyl or pyridyl, provided that when R3 is hydrogen or alkyl, R_1 and R_2 are both alkyl or together form an unsubstituted nitrogen-containing heterocyclic ring and Y is a hydrogen, X is not oxygen; - or X is :N-R4 and R forms, with R4 and the atoms to which they are attached, imidazolinyl or imidazolyl unsubstituted or substituted by 1 or 2 alkyl radicals, or hexahydrobenzimidazolyl; the aforesaid alkyl radicals being (except where otherwise stated) linear or branched and having 1 to 4 carbon atoms each, in its optical isomers of asymmetric carbon, and its acid addition salts.

4,985,420

1,7-ANNELATED INDOLECARBOXYLIC ACID ESTERS AND -AMIDES

Derk Hammings; Hans H. Haeck; Ineke Van Wijngaarden, and Wouter Wouters, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

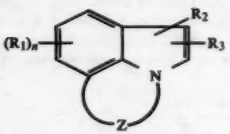
Filed Dec. 7, 1988, Ser. No. 280,886

Claims priority, application Netherlands, Dec. 10, 1987, 8702981

Int. Cl.[5] **A61K** *31/55, 31/44;* **C07D** *491/00, 487/12*

U.S. Cl. 514—211 **4 Claims**

1. Indole derivatives of the general formula 2



(2)

wherein

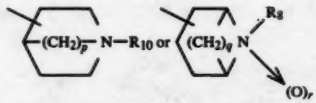
R_1 is halogen,

n has the value 0–2;

Z together with the carbon atom and the nitrogen atom and the intermediate carbon atom forms a heterocyclic group consisting of 7 or 8 ring atoms, in which, besides the nitrogen atom already present, a second hetero atom selected from the group consisting of N, O, and S may be present, which ring may be annelated with a benzene ring;

R_3 is hydrogen, halogen, alkyl, alkoxy or alkylthio having 1–4 C-atoms, and

R_2 is a group -CO-Y-R_7 wherein Y is an oxygen atom, or a group -NR_6 wherein R_6 is hydrogen or alkyl having 1–3 C-atoms, and R_7 represents a group of the formula



wherein p has the value 1 or 2, g has the value 2 or 3, R_8 is hydrogen, alkyl or hydroxyalkyl having 1 or 2 C-atoms, and r is 0 or 1; and the pharmacologically acceptable acid addition salts thereof.

4,985,421

FUNGICIDAL SUBSTITUTED DIOXOLANYLETHYLAMINE

Wolfgang Krämer, Burscheid; Joachim Weissmüller, Monheim; Dieter Berg, Wuppertal; Wilhelm Brandes, Leichlingen, and Stefan Dutzmann, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

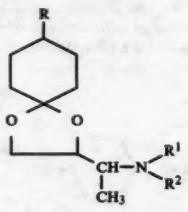
Filed Aug. 17, 1989, Ser. No. 395,231

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1988, 3828490

Int. Cl.[5] **C01D** *285/00, 491/00, 273/00, 211/00*

U.S. Cl. 514—212 **11 Claims**

1. A substituted dioxolanylethylamine of the formula



(I)

wherein

R represents straight-chain or branched alkyl having 1 to 12 carbon atoms, or represents cycloalkylalkyl or cycloalkyl having in each case 3 to 7 carbon atoms in the cycloalkyl part and if appropriate 1 to 6 carbon atoms in the straight-chain or branched alkyl part and in each case optionally substituted by one or more identical or different substituents from the group consisting of halogen and straight-chain or branched alkyl having 1 to 8 carbon atoms, or represents aralkyl or aryl having in each case 6 to 10 carbon atoms in the aryl part and if appropriate 1 to 6 carbon atoms in the straight-chain or branched alkyl part and in each case optionally substituted by one or more identical or different substituents from the group consisting of halogen and straight-chain or branched alkyl having 1 to 8 carbon atoms, and

R^1 and R^2 independently of one another each represents hydrogen, or represents in each case straight-chain or branched alkyl having 1 to 12 carbon atoms, alkenyl having 3 to 8 carbon atoms, hydroxyalkyl having 2 to 6 carbon atoms, alkoxyalkyl or dialkoxyalkyl having in each case 1 to 6 carbon atoms or hydroxyalkoxyalkyl having 2 to 6 carbon atoms in the individual alkyl parts, or represents alkoxycarbonylalkyl having 1 to 6 carbon atoms per alkoxy and alkyl part, or represents in each case straight-chain or branched dioxolanylalkyl, dioxanylalkyl or oxolanylalkyl having in each case 1 to 4 carbon atoms in the alkyl part, or represents cycloalkyl or cycloalkylalkyl having in each case 3 to 7 carbon atoms in the cycloalkyl part and if appropriate 1 to 4 carbon atoms in the straight-chain or branched alkyl part and in each case optionally substituted in the cycloalkyl part by one or more identical

or different substituents selected from the group consisting of halogen, and in each case straight-chain or branched alkyl, alkoxy, halogenoalkyl or halogenoalkoxy having in each case 1 to 4 carbon atoms and if appropriate 1 to 9 identical or different halogen atoms; or furthermore represents arylalkyl, arylalkenyl or aryl having in each case 6 to 10 carbon atoms in the aryl part and if appropriate up to 6 carbon atoms in the straight-chain or branched alkyl or alkenyl part and in each case optionally substituted in the aryl part by one or more identical or different substituents selected from the group consisting of halogen, cyano, nitro and in each case straight-chain or branched alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy, halogenoalkylthio, alkoxycarbonyl or alkoximinoalkyl having in each case 1 to 4 carbon atoms in the individual alkyl parts and if appropriate 1 to 9 identical or different halogen atoms, or

R^1 and R^2, together with the nitrogen atom to which they are bonded, represent a saturated 5- to 7-membered heterocyclic radical which can optionally contain a further hetero atom and is optionally substituted by one or more identical or different substituents selected from the group consisting of in each case straight-chain or branched alkyl or hydroxyalkyl having in each case 1 to 4 carbon atoms,

or an acid addition salt thereof.

4,985,422
LACTAM DERIVATIVES

Peter C. North; Alexander W. Oxford, both of Royston; Ian H. Coates, Hertford, and Paul J. Beswick, Ware, all of England, assignors to Glaxo Group Limited, England

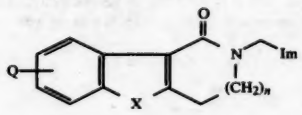
Filed Apr. 26, 1989, Ser. No. 343,359

Claims priority, application United Kingdom, Apr. 27, 1988, 8809933; Sep. 1, 1988, 8820652; Sep. 1, 1988, 8820648

Int. Cl.[5] C07D *487/04, 471/04;* A61K *31/55, 31/445*

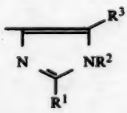
U.S. Cl. 514—215 **11 Claims**

1. A compound of formula (I)

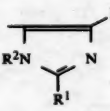


(I)

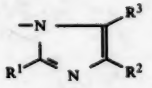
wherein Im represents an imidazolyl group of the formula (a), (b) or (c):



(a)



(b)



(c)

one of the groups represented by R^1, R^2 and R^3 is a hydrogen atom or a C_{1-6}alkyl, C_{3-7}cycloalkyl, C_{3-6}alkenyl, phenyl or phenylC_{1-3}alkyl group, and each of the other two groups, which may be the same or different, represents a hydrogen atom or a C_{1-6}alkyl group;

n represents 1 or 2;

Q represents a hydrogen atom, a halogen atom, or a hydroxy, C_{1-4}alkoxy, phenylC_{1-3}alkoxy or C_{1-6}alkyl group, or a group $—NR^4R^5$ or $—CONR^4R^5$ (wherein R^4 and R^5, which may be the same or different, each represents a hydrogen atom or a C_{1-4}alkyl or C_{3-4}alkenyl group, or together with the nitrogen atom to which they are attached from a saturated 5 to 7 membered ring); and X represents an oxygen or a sulphur atom, and, when Im represents an imidazolyl group of formula (c), X may also represent the group NR^6, where R^6 represents a hydrogen atom or a group selected from C_{1-6}alkyl, C_{3-6}alkenyl, C_{3-10}alkynyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkylC_{1-4}alkyl, phenyl, phenylC_{1-3}alkyl, $—CO_2R^7$, $—COR^7$, $—CONR^7R^8$ or $—SO_2R^7$ (where R^7 and R^8, which may be the same or different, each represents a hydrogen atom, a C_{1-6}alkyl or C_{3-7}cycloalkyl group, or a phenyl or phenylC_{1-4}alkyl group, in which the phenyl group is optionally substituted by one or more C_{1-4}alkyl, C_{1-4}alkoxy or hydroxy groups or halogen atoms, with the proviso that R^7 does not represent a hydrogen atoms when R^6 represents a group $—CO_2R^7$ or $—SO_2R^7$); or a physiologically acceptable salt or solvate thereof.

11. A method of treating a condition mediated through 5-HT_3 receptors which comprises administering to a patient an effective amount to relieve said condition of a compound of formula (I) as defined in claim or a physiologically acceptable salt or solvate thereof.

4,985,423
NEW 1,4-DIAZEPINE DERIVATIVES HAVING ANIT-ULCER ACTIVITY

Jacobus A. J. den Hartog; Herman H. van Stuivenberg, and Ineke van Wijngaarden, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Filed Jul. 3, 1989, Ser. No. 374,775

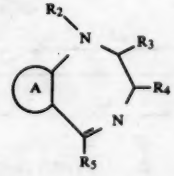
Claims priority, application Netherlands, Jul. 7, 1988, 8801716

Int. Cl.[5] C07D *471/04, 495/04, 495/14, 493/04*

U.S. Cl. 514—219 **4 Claims**

1. Compounds of formula (1)

	C %	H %	N %
Calculated	42.25	2.66	8.21
Found	42.37	2.58	8.39



wherein the symbols have the following meanings:

A together with the two carbon toms of the seven membered ring, forms a group selected from the formulae (2), (3), (4) and (7)

	C %	H %	N %
Calculated	43.53	2.44	8.46
Found	43.47	2.28	8.64

wherein

R is halogen, alkyl, alkoxy, alkylthio, amino, mono- or dialkylamino, hydroxyalkyl, alkylcarbonyl, aminocarbonyl,

mono- or dialkylamino carbonyl, alkoxycarbonyl, nitro, cyano, trifluoromethyl, trifluoromethoxy, alkylsulphonyl, aminosulphonyl, hydroxy, phenyl or benzoyl, and m has the value 0–4, or $(R)_m$ is alkylene dioxy,

Q_1 is oxygen or sulphur,

n has the value 3 or 4;

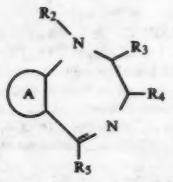
R_2 is hydrogen, alkyl, phenylalkyl, alkylcarbonyl, aminocarbonyl, mono- or dialkylaminocarbonyl, alkoxycarbonyl or alkoxycarbonylalkyl;

R_3 and R_4 independently of each other are hydrogen, alkyl or hydroxy; and

R_5 is phenyl, thienyl, cyclopentyl, cyclohexyl, n-pentyl, n-hexyl, benzyl, phenethyl, phenylethynyl, phenylamino, or benzylamino, which groups may be substituted with the group $(R)_m$, with the proviso that R cannot be halogen or hydroxy if the substituent is bonded to a nitrogen atom, and with the proviso that if m has the value 0, Q_1 is oxygen, R_2, R_3 and R_4 are hydrogen and R_5 is phenyl, A cannot be a group of formula (2).

3. Pharmaceutical compositions having anti-ulcer activity which comprise an effective amount of at least one compound of formula (1) as an active substance

	C %	H %	N %
Calculated	57.93	4.86	9.65
Found	57.95	5.05	9.55



(1)

wherein the symbols have the following meanings:

A together with the two carbon atoms of the seven membered ring, forms a group selected from the groups of the formulae (2), (3), (4) and (7)

	C %	H %	N %
Calculated	53.57	4.80	8.33
Found	53.28	4.91	8.21

	C %	H %	N %
Calculated	43.53	2.44	8.46
Found	43.47	2.28	8.64

wherein

R is halogen, alkyl, alkoxy, alkylthio, amino, mono- or dialkylamino, hydroxyalkyl, alkylcarbonyl, aminocarbonyl, mono- or dialkylamino carbonyl, alkoxycarbonyl, nitro, cyano, trifluoromethyl, trifluoromethyl, alkylsulphonyl, aminosulphonyl, hydroxy, phenyl or benzoyl, and m has the value 0–4, or $(R)_m$ is alkylene dioxy,

Q_1 is oxygen or sulphur,

n has the value 3 or 4;

R_2 is hydrogen, alkyl, phenylakyl, alkylcarbonyl, aminocarbonyl, mono- or dialkylaminocarbonyl, alkoxycarbonyl or alkoxycarbonylalkyl;

R_3 and R_4 independently of each other are hydrogen, alkyl or hydroxy; and

R_5 is phenyl, thienyl, cyclopentyl, cyclohexyl, n-pentyl, n-hexyl, benzyl, phenethyl, phenylethynyl, phenylamino, or benzylamino, which groups may be substituted with the group $(R)_m$ with the proviso that R cannot be halogen or hydroxy if the substituent is bonded to a nitrogen atom, or a salt thereof with a pharmacologically acceptable acid and auxiliary substances.

4,985,424

CERTAIN SUBSTITUTED 1,7-ANNELATED 1H-INDAZOLES BEING SELECTIVE ANTAGONISTS OF 5-HT-RECEPTORS

Ineke van Wijngaarden; Derk Hamminga; Hans H. Haeck, and Wouter Wouters, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

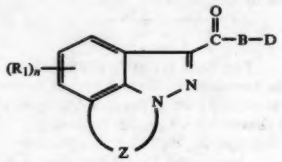
Division of Ser. No. 374,736, Jul. 3, 1989, Pat. No. 4,950,759. This application Jun. 12, 1990, Ser. No. 536,470

Claims priority, application Netherlands, Jul. 7, 1988, 8801715

Int. Cl.[5] **A61K** *31/55;* **C07D** *227/12*

U.S. Cl. 514—220 **3 Claims**

1. Compounds of formula (1)



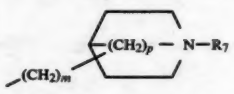
(1)

wherein

Z, together with the carbon and the nitrogen and the intermediate carbon, forms a heterocyclic group consisting of 7 ring atoms;

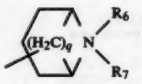
B, is oxygen or $-CH(R_4)-$ or $-NR_4-$, wherein R_4 is hydrogen, straight or branched alkyl having 1–6 carbon atoms, or benzyl;

D is a group B-C-D of the formulae 2–9:

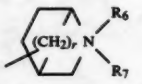


(2)

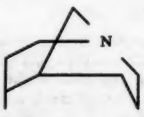
(3)



(4)

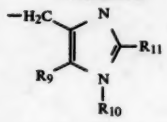


(5)

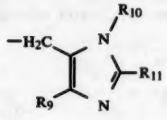


(6)

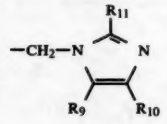
-continued



(7)



(8)



(9)

wherein p is 1 or 2; m is 0 or 1; q is 2, 3 or 4; r is 1,2 or 3; R_6 is hydrogen or alkyl of 1–6 carbon atoms; one of R_9, R_{10} and R_{11} is hydrogen, alkyl of 1–4 carbon atoms, cycloalkyl of 3–6 carbon atoms or alkenyl of 2–4 carbon atoms and the other two groups are independently of each other hydrogen or alkyl of 1–4 carbon atoms; and the pharmacologically acceptable acid addition salts thereof.

4,985,425

DISSOLVED COMPOSITION OF [BENZO-1,2,4-THIADIAZINE]-1,1-DIOXIDE

Tadahiro Chiba; Kiyoshi Miyazawa; Makoto Uzuka, and Takashi Suzuki, all of Yokohama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 89,386, Aug. 25, 1987, abandoned. This application Jan. 21, 1988, Ser. No. 146,451

Claims priority, application Japan, Jan. 22, 1987, 62-013061; Feb. 5, 1987, 62-025439; Feb. 23, 1987, 62-039757

Int. Cl.[5] A61K *7/06, 9/08, 31/395*

U.S. Cl. 514—222.2 **26 Claims**

1. A dissolved composition comprising:

(A) at least one [benzo-1,2,4-thiadiazine]-1,1-dioxide;

(B) dimethyl sulfoxide, benzyl alcohol, or the mixture thereof;

(C) water; and

(D-2) at least one surfactant, other than anionic surfactants, having a nitrogen atom in the molecule thereof.

4,985,426

ARALKYLAMINOPYRIMIDINE DERIVATIVE, PROCESS FOR PRODUCING THEREOF AND INSECTICIDE, ACARICIDE AND FUNGICIDE CONTAINING SAID DERIVATIVE AS ACTIVE INGREDIENT

Hirosuke Yoshioka, Wako; Tokio Obata, Ube; Katsutoshi Fujii, Ube; Kiyoshi Tsutsumiuchi, Ube, and Haruo Yoshiya, Ube, all of Japan, assignors to UBE Industries, Ltd., Ube and The Institute of Physical and Chemical Research, Wako, both of, Japan

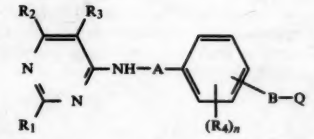
Division of Ser. No. 105,403, Dec. 7, 1987, Pat. No. 4,895,849. This application Nov. 13, 1989, Ser. No. 435,937

Claims priority, application Japan, Oct. 8, 1986, 61-237878; May 6, 1987, 62-108899; Sep. 10, 1987, 62-225180

Int. Cl.[5] A01N *43/54;* **C07D** *239/42*

U.S. Cl. 514—241 **4 Claims**

1. An acaricidal composition comprising (i) an acaricidal carrier and (ii) as the active ingredient a compound represented by the formula:



(I)

wherein R_1 represents a hydrogen atom or a lower alkyl group which is unsubstituted or substituted with a halogen atom; R_2 and R_3 each independently represent a halogen atom or a lower alkyl group which is unsubstituted or substituted with a halogen atom, a lower alkoxy group or a lower alkylthio group; R_4 represents a hydrogen atom, a halogen atom or a lower alkyl group; n represents an integer of 1 or 2; Q represents a phenyl group or a heterocyclic group selected from the group consisting of a furyl group, a thienyl group, a pyrrolyl group, an oxazolyl group, an isooxazolyl group, a thiazolyl group, an isothiazolyl group, an imidazolyl group, a pyrazolyl group, an oxadiazolyl group, a tetrazolyl group, a pyranyl group, a pyridyl group, a pyridazinyl group, a pyrimidinyl group, a pyrazinyl group, a symmetrical triazinyl group, a benzoxazolyl group, a benzoxozoyl group, a benzoimidazolyl group, a quinazolinyl group, a quinolyl group and a quinoxalinyl group each of which phenyl and heterocyclic group is unsubstituted or substituted with at least one selected from the group consisting of a halogen atom, a nitro group, a lower alkoxy group, a lower alkylthio group, a lower alkyl group which is unsubstituted or substituted with a halogen atom or a lower alkoxy group, a phenyl group which is unsubstituted or substituted with a lower alkoxy group and a phenoxy group which is unsubstituted or substituted with a halogen atom or an unsubstituted or halogen atom-substituted lower alkyl group; said heterocyclic group may be substituted with an oxo group; an alkyl group having 5 to 10 carbon atoms; an allyl group; a geranyl group; a farnesyl group; a lower alkyl group substituted with 1 to 4 halogen atoms; a cycloalkylmethyl group having 3 to 6 carbon atoms; an ethyl group substituted with a lower alkoxy group, a lower alkoxyalkyl group, a lower alkylthio group, a lower alkylsulfonyl group or a phenoxy group which may be substituted with one or two lower alkyl groups; a glycidyl group; an acetonyl group; a dioxoranyl group substituted with a phenoxymethyl group which may be substituted with a chlorine atom; a 2,2-diethoxyethyl group, a 1-ethoxycarbonylethyl group, a trimethylsilylmethyl group, a 1-pyridylethyl group, a lower alkyl group substituted with a benzylimino group which may be substituted with a lower alkoxyimino group or a lower alkyl group; A represents a lower alkylene group which is unsubstituted or substituted with one or two substituents selected from the group consisting of a cycloalkyl group having 3 to 5 carbon atoms, a lower alkynyl group, a lower alkyl group substituted with a halogen atom, a lower alkoxy group or a lower alkylthio group; and B represents a direct bond, an oxygen atom, a sulfur atom, a straight or branched lower alkylene group or a lower alkyleneoxy group;

or an acid addition salt thereof.

4,985,427

TRIAZINE DERIVATIVES

Ian Waterhouse; Alan Naylor; Christopher J. Wallis, all of Royston, and Frank Ellis, Luton, all of England, assignors to Glaxo Group Limited, England

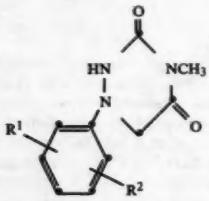
Filed Apr. 28, 1989, Ser. No. 344,667

Claims priority, application United Kingdom, Apr. 29, 1988, 8810185

Int. Cl.[5] C07D *253/075;* A61K *31/53*

U.S. Cl. 514—242 11 Claims

9. A method of treatment of a human or animal subject suffering from or susceptible to diseases in which leukotrienes or other 5-lipoxygenase products are mediators, which comprises administering to the subject an effective amount of a compound selected from compounds of formula



(I)

wherein R^1 is selected from the group consisting of hydrogen, halogen, hydroxy, C_{1-6} alkyl, C_{1-6} alkoxy, phenyl C_{1-3} alkoxy (in which the phenyl group is optionally substituted by a substituent selected from halogen, C_{1-3} alkyl, C_{1-3} alkoxy and hydroxy), nitro, trifluoromethyl, cyano, $—CO_2R^3$ (wherein R^3 is selected from hydrogen and C_{1-4} alkyl) and $—CONR^4R^5$ (wherein R^4 and R^5 are each independently selected from hydrogen and C_{1-4} alkyl; and R^2 is selected from the group consisting of hydrogen, halogen, hydroxy, C_{1-6} alkyl and C_{1-6} alkoxy; or a physiologically acceptable salt thereof.

4,985,428

ISOXAZOLES WITH NOOTROPIC ACTIVITY

Angelo Carenzi, Busto Arsizio; Dario Chiarino, Monza; Davide Della Bella; Mauro Napoletano, both of Milan, and Alberto Sala, Monza, all of Italy, assignors to Zambon Group S.p.A., Venice, Italy

PCT No. PCT/EP88/00445, § 371 Date Mar. 20, 1989, § 102(e) Date Mar. 20, 1989, PCT Pub. No. WO88/09330, PCT Pub. Date Dec. 1, 1988

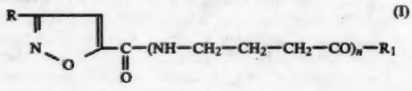
PCT Filed May 19, 1988, Ser. No. 302,747

Claims priority, application Italy, May 20, 1987, 20589 A/87; May 20, 1987, 20590 A/87

Int. Cl.[5] A61K *31/495, 31/42;* C07D *261/18, 413/12*

U.S. Cl. 514—252 7 Claims

1. A compound of formula



(I)

wherein

n represents a number selected from 1 and 2;

R represents a hydrogen atom, a halogen atom, hydroxy, a C_1–C_6 alkyl or alkoxy;

R_1 represents hydroxy, an optionally unsaturated C_1–C_{18} alkoxy or an

group;

R_2 and R_3, the same or different, represent a hydrogen atom, a linear or branched C_1–C_6 alkyl, or a group of formula

$(CH_2)_mR_4$

wherein

m represents an integer selected from 1, 2 and 3;

R_4 represents a carboxy group, an alkoxycarbonyl group having from 1 to 6 carbon atoms in the alkoxy moiety or a group of formula

;

R_5 and R_6, the same or different, represent a hydrogen atom or a linear or branched C_1–C_6 alkyl;

or one of R_2 and R_3 represents a group of formula

wherein R_4 has the above meanings and R_7 represents a linear or branched C_1–C_4 alkyl optionally substituted by phenyl, hydroxy or by a mercapto group, and the other one of R_2 and R_3 represents a hydrogen atom;

or in addition

R_2 and R_3, together with the nitrogen atom to which they are bonded, form a heterocyclic selected among the class consisting of 1-pyrrolidinyl, 1-piperazinyl, 4-methyl-1-piperazinyl, 1-piperidyl and 1-pyrrolidinyl-2-one;

and pharmaceutically acceptable salts thereof.

4,985,429

AMINOMETHYL OXOOXAZOLIDINYL CYCLOALKYLBENZENE DERIVATIVES USEFUL AS ANTIBACTERIAL AGENTS

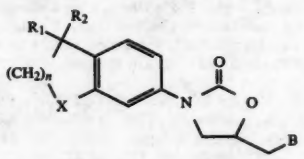
Chia-Lin J. Wang, and Mark A. Wuonola, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 233,828, Aug. 19, 1988, Pat. No. 4,921,869, which is a division of Ser. No. 106,358, Oct. 9, 1987, Pat. No. 4,801,600. This application Mar. 15, 1990, Ser. No. 497,211

Int. Cl.[5] A61K *31/495;* C07D *405/14, 413/14*

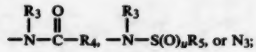
U.S. Cl. 514—253 18 Claims

1. A compound having the formula

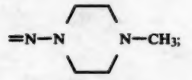


(I)

wherein for the l isomer or racemic mixtures containing it B is NH_2,



u is 1 or 2;
R_3 is H, alkyl of 1–10 carbon atoms, or cycloalkyl of 3–8 carbon atoms;
R_4 is H, alkyl of 1–4 carbon atoms, alkenyl of 2–4 carbon atoms, cycloalkyl of 3–4 carbon atoms, or OR_5;
R_5 is alkyl of 1–4 carbon atoms;
X is O or S;
R_6 is H or alkyl of 1–4 carbon atoms;
n is 1–3; and
R_1 and R_2 taken together are



or a pharmaceutically suitable salt thereof; provided that:
(1) when n is 2, then X is not S; and
(2) when n is 3, then X is not O.

13. A method of treating a bacterial infection in a mammal comprising administering to the mammal an antibacterial amount of a compound of claim **1**.

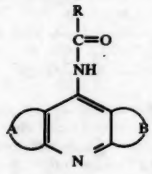
4,985,430

9-ACYLAMINO-TETRAHYDROACRIDINE DERIVATIVES AND MEMORY ENHANCING AGENT CONTAINING SAID DERIVATIVE AS ACTIVE INGREDIENT

Shuji Morita, Yokohama; Ken-Ichi Saito; Kunihiro Ninomiya, both of Machida; Akihiro Tobe, Yokohama; Issei Nitta, Machida, and Mamoru Sugano, Kawasaki, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

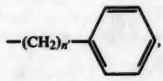
Filed Dec. 2, 1988, Ser. No. 279,051
Claims priority, application Japan, Dec. 3, 1987, 62-306753; Nov. 9, 1988, 63-283351; Dec. 2, 1988, 63-305799
Int. Cl.[5] A61K *31/505, 31/435, 31/495;* **C07D** *401/12, 219/08, 221/18, 221/16, 221/16*
U.S. Cl. 514—253 **10 Claims**

1. A 9-acylamino-tetrahydroacridine derivative of the following formula (I):

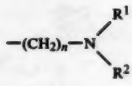


(I)

wherein:
R represents (i) a C_{2-8} alkyl group, (ii)

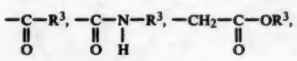


Wherein N'=1 to 3 or (iii) a group of formula (II):

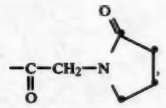


(II)

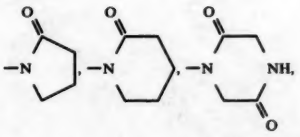
where R^1 represents a hydrogen atom or a C_{1-6} alkyl group, R^2 represents a hydrogen atom,

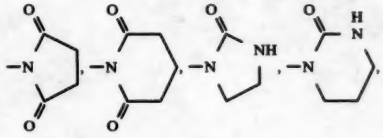


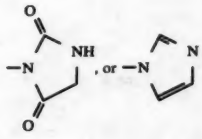
where R^3 is hydrogen or a C_{1-6} alkyl group, or



or R^1 and R^2 taken together with the nitrogen atom to which they are attached form

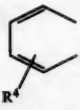




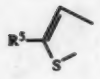


and n is 1 or 2;

represents
(i)



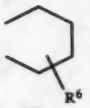
where R^4 is hydrogen, halogen, C_{1-4} alkyl, alkoxy or hydroxyl; or
(ii)



where R^5 is hydrogen or C_{1-4} alkyl; and

represents

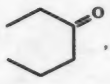
(i)



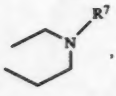
where R^6 is hydrogen, C_{1-4} alkyl or hydroxyl,

(ii)

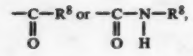
(iii)



(iv)



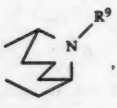
where R^7 is hydrogen, C_{1-4} alkyl, benzyl, phenethyl,



where R^8 is hydrogen or C_{1-6} alkyl,

(v)

(vi)



where R^9 is hydrogen atom or C_{1-6} alkyl,

(vii)

(viii)

(ix)

(x)

or

(xi)

its optical antipode or pharmaceutically acceptable acid addition salt thereof.

9. A memory enhancing composition, comprising:

an effective amount of the 9-acylaminotetrahydroacridine derivative, its optical antipode or pharmaceutically acceptable acid addition salt thereof of claim 1 which activates a presynaptic site of the cholinergic neurons by increasing a high affinity choline uptake function to cholinergic neurons in combination with a pharmaceutically acceptable excipient.

4,985,431

PHARMACEUTICAL COMPOSITION FOR TREATING AND PREVENTING CARDIOVASCULAR DISEASE

Yaguang Liu, 30 Seaman Ave., New York, N.Y. 10034

Division of Ser. No. 910,240, Sep. 22, 1986, Pat. No. 4,906,470.
This application Dec. 13, 1989, Ser. No. 449,748
Int. Cl.[5] A61K *31/495*
U.S. Cl. 514—255 **1 Claim**

1. A process for producing tetramethyl pyrazine comprising:

a. extracting ground roots and stems of a plant selected from the group consisting of *Ligusticum chuanxiong Hort* and *Ligusticum wallichii* Franch with 95% ethanol and refluxing the ethanol for about 2 hours;

b. distilling the ethanol extract under reduced pressure to yield a residue;

c. dissolving the resulting residue in warm water;

d. extracting the resulting aqueous solution of step c twice, when cooled, with an equal volume of petroleum ether;

e. extracting the resulting ether phase with an equal volume of 0.1N HCl;

f. separating and adjusting the aqueous phase to pH 9–10 with sodium carbonate;

g. extracting the aqueous phase of step f with chloroform;

h. collecting the chlorofom extract and distilling the same under reduced pressure to recover chloroform and yield a residue gel;

i. dissolving the resulting residue gel in petroleum ether;

j. distilling the petroleum ether under reduced pressure to yield a second residue;

k. dissolving the second residue of step j in a mixture of 8:2 petroleum ether and chloroform;

l. distilling the mixture of step k under reduced pressure to yield a solid residue;

m. dissolving the solid residue in warm water, cooling the resulting aqueous solution and adjusting the same to pH 8–9; and

n. distilling the aqueous solution, cooling and crystallizing needle tetramethyl pyrazine.

4,985,432
5H-1,3,4-THIADIAZOLO(3,2-A)PYRIMIDIN-5-ONE DERIVATIVES AND AGRICULTURAL-HORTICULTURAL FUNGICIDE COMPOSITION CONTAINING THE SAME

Yukio Tokunaga; Koichiro Kaku, both of Shizuoka; Yoshiyuki Kojima, Kakegawa; Shinichiro Maeno; Nobumitsu Sawai, both of Shizuoka, and Yasuo Saso, Miyagi, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 34,922, Apr. 6, 1987, abandoned. This application Sep. 13, 1989, Ser. No. 406,184

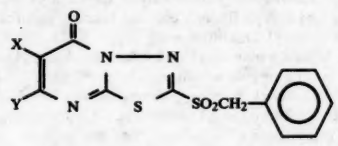
Claims priority, application Japan, Apr. 7, 1986, 61-78099

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[5] A01N *43/54*

U.S. Cl. 514—258 6 Claims

1. A method of protecting plants against agricultural or horticultural fungi, comprising applying to a plant, a fungicidally effective amount of a 5H-1,3,4,-thiadiazolo[3,2-a]pyrimidin-5-one represented by the formula (I)



(I)

wherein X is a hydrogen atom, a halogen atom, an alkyl group or a phenyl group; and Y is a hydrogen atom or a halogen atom.

4,985,433
2-AMINO-7-(PYRIDINYLMETHYL)-3H,5H-PYRROLO[3,2-D]PYRIMIDIN-4-ONES AND PHARMACEUTICAL USES AND COMPOSITIONS CONTAINING THE SAME

John A. Secrist, III; John A. Montgomery; Steve E. Ealick, all of Birmingham, Ala.; Mark D. Erion, Livingston, and Wayne C. Guida, Fanwood, both of N.J., assignors to BioCryst, Inc., Birmingham, Ala.

Filed Oct. 31, 1989, Ser. No. 429,100

Int. Cl.[5] A61K *31/505;* C07D *487/00*

U.S. Cl. 514—258 9 Claims

1. A compound of the formula 2-amino-7-(substituted methyl)-3H,5H-pyrrolo[3,2-d]pyrimidin-4-one wherein substituted methyl is $—CH_2—R$ wherein R is pyridinyl optionally substituted by halogen, hydroxy, alkoxy, alkyl or trifluoromethyl.

6. A method for the selective suppression of mammalian T-cell function without diminished effect on humoral immunity which comprises administering to a mammal the compound of claim 1, whereby said compound inhibits purine nucleoside phosphorylase and thereby T-cell formation.

4,985,434
7-SUBSTITUTED DERIVATIVES OF 2-AMINO-3H,5H-PYRROLO(3,2-D)PYRIMIDIN-4-ONES AND PHARAMCEUTICAL USES AND COMPOSITIONS CONTAINING THE SAME

John A. Secrist, III; John A. Montgomery; Steve E. Ealick, all of Birmingham, Ala.; Mark D. Erion, Livingston, and Wayne C. Guida, Fanwood, both of N.J., assignors to Biocryst, Inc., Birmingham, Ala.

Filed Oct. 31, 1989, Ser. No. 429,098

Int. Cl.[5] C07D *487/02;* A61K *31/495*

U.S. Cl. 514—248 14 Claims

1. A compound of the formula 2-amino-7-(R)-3H5H-pyrrolo[3,2-d]pyrimidin-4-one wherein R is cyclohexyenyl or cyclohexyl optionally substituted by halogen, hydroxy, alkoxy, alkyl or trifluoromethyl.

6. A method for the selective suppression of mammalian T-cell function without diminished effect on humoral immunity which comprises administering to a mammal the compound of claim 1, whereby said compound inhibits purine nucleoside phosphorylase and thereby T-cell formation.

4,985,435
2-SUBSTITUTED-1-NAPHTHOLS AS 5-LIPOXYGENASE INHIBITORS

Douglas G. Batt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

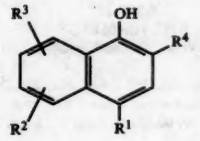
Division of Ser. No. 839,912, Mar. 19, 1986, Pat. No. 4,833,164, which is a continuation-in-part of Ser. No. 731,791, May 8, 1985, abandoned. This application Mar. 16, 1989, Ser. No. 324,534

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] A61K *31/435;* C07D *211/32, 207/04*

U.S. Cl. 514—277 18 Claims

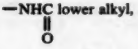
1. A compound having the formula:



(II)

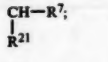
wherein

R^1 is CH_3, Br, Cl, OH, C_2H_5, COR^{17}, $COOR^{18}$, $CONR^{19}R^{20}$, phenyl, $—N(R^{12})(R^{13})$,

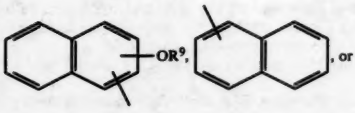


$S(O)_p$ lower alkyl where p is 0, 1, or 2, SO_2NH_2, or $—NHSO_2$ lower alkyl optionally substituted with F;

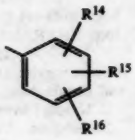
R^2 and R^3 independently are H, CH_3, C_2H_5, CH_3O, or C_2H_5O; R^4 is



R^7 is



-continued



R^9 is H or C_1–C_4 alkyl;

R^{12} and R^{13} independently are H, C_1–C_4 alkyl, or together are $(CH_2)_{4-5}$;

R^{14} is H, C_1–C_4 alkyl, OR^9, O-phenyl, OCH_2COOR^9, O-benzyl, $COOR^9$, CF_3, Cl, Br, I, $N(R^{12})(R^{13})$, or $S(O)_wR^9$ where w is 0–2 with the proviso that if w is 1, then R^9 is not H; and

R^{15} and R^{16} are independently H, C_1–C_4 alkyl, OR^9, O-benzyl, F or Cl;

R^{17} is lower alkyl, phenyl optionally monosubstituted with Cl, Br, F, CH_3, CH_3O, pyridyl, thienyl or furyl;

R^{18} is H or lower alkyl;

R^{19} and R^{20} independently are H or lower alkyl, or taken together are $(CH_2)_{4-5}$; and

R^{21} is H.

4,985,436

COMPOSITION OF MATTER FOR INHIBITING LEUKEMIAS AND SARCOMAS

George R. Pettit, Paradise Valley, Ariz., assignor to Arizona Board of Regents, Tempe, Ariz.

Filed Feb. 17, 1984, Ser. No. 581,188

Int. Cl.[5] A61K *31/47*

U.S. Cl. 514—287 10 Claims

1. An antineoplastic substance denominated pancratistatin.

4,985,437

MEDICAMENTS

Michael B. Tyers, Ware, England, assignor to Glaxo Group Limited, England

Filed Dec. 16, 1987, Ser. No. 133,885

Claims priority, application United Kingdom, Dec. 17, 1986, 8630077; Dec. 17, 1986, 8630076; Dec. 17, 1986, 8630074; Mar. 25, 1987, 8707175

Int. Cl.[5] A61K *31/46*

U.S. Cl. 514—304 5 Claims

1. A method for the treatment of dementia and other cognitive disorders which comprises administering to a human or animal subject suffering from dementia or another cognitive disorder an effective amount for the treatment of said dementia or other cognitive disorder of a compound of formula I

TABLE I

Design Parameters for a Narrow-Band Optical Interference Filter of the 1.0 HL HH LHLHL HH L'H 1.0 Type

	Optical Thin Film Filter (Pass Wavelength = 1.00 um)	
	Refractive Index	Thickness (A)
Input Region	1.00	. . .
Region 1 (H)	4.00	625.000
Region 2 (L)	1.35	1851.852
Region 3 (L')	1.83	1366.120
Output Region	1.00	. . .

wherein R_1 and R_2 independently represent hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy, amino, C_{1-4} alkylamino, di(C_{1-4})alkylamino, mercapto or C_{1-4} alkylthio;

R_3 represents hydrogen, C_{1-4} alkyl, C_{3-5} alkenyl, aryl or aralkyl;

R_4 represents hydrogen, C_{1-7} alkyl, C_{3-5} alkenyl or aralkyl;

n is 2 or 3;

the free valence is attached to either fused ring, and the azabicyclic ring is in either the exo or endo configuration; or a physiologically acceptable salt or solvate thereof.

4,985,438

PYRIDYL-AND/OR PYRIDOYL-(PIPERID-4-YL) UREAS AND ANALOGUES THEREOF

John L. Archibald, Farnham Royal, and Terence J. Ward, Maidenhead, both of United Kingdom, assignors to John Wyeth & Brother, Limited, Maidenhead, England

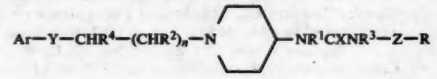
Division of Ser. No. 929,964, Nov. 12, 1986, Pat. No. 4,806,552, which is a continuation-in-part of Ser. No. 781,832, Sep. 30, 1985, Pat. No. 4,722,930, which is a division of Ser. No. 545,802, Oct. 26, 1983, Pat. No. 4,563,466, which is a continuation-in-part of Ser. No. 366,266, Apr. 7, 1982, Pat. No. 4,426,387, which is a continuation of Ser. No. 238,381, Feb. 25, 1981, abandoned. This application Oct. 19, 1988, Ser. No. 259,653

Claims priority, application United Kingdom, Mar. 1, 1980, 8007048; Aug. 22, 1980, 8027435; Nov. 15, 1985, 8528235

Int. Cl.[5] A61K *31/445*; C07D *401/12, 401/00*

U.S. Cl. 514—307 20 Claims

1. A compound of the formula:



wherein n is 0 or 1;

R^1, R^2, R^3 and R^4 are independently hydrogen or C_1–C_4 alkyl;

X is =O or =S;

Y is —O— or a direct bond;

Z is —CO— or $—CH_2—$;

R is 2, 3 or 4-pyridyl or 2, 3 or 4-pyridyl substituted by one or two substituents selected from C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, fluoro, chloro, bromo, chloroethyl, trifluoromethyl, and nitro, and;

Ar is 2, 4, 5 or 6-quinolinyl or 2,4,5 or 6-quinolinyl substituted by one or two substituents selected from C_1–C_4alkyl, C_1–C_4alkoxy, hydroxy, fluoro, chloro, bromo, chloroethyl, trifluoromethyl, amino, C_1–C_4alkylamino, di(C_1–C_4alkyl)amino, C_1–C_4alkylcarbonylamino, dimethane or diethanesulphonylamino, nitro or cyano, or

a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof, in which the dotted line represents an optional double bond.

4,985,439

GLUCOSE TOLERANCE FACTOR AND METHOD OF MAKING SAME

David Hwang, Arcadia; Arye Lev-Ran, Cypress, and Ken Barseghian, deceased, late of Glendale, all of Calif. by Iemma Barseghian, legal representative , assignors to Anheuser-Busch Companies, Inc., St. Louis, Mo.

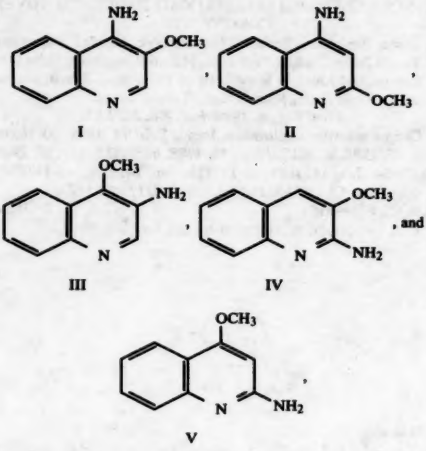
PCT No. PCT/US86/02493, § 371 Date Sep. 21, 1987, § 102(e) Date Sep. 21, 1987

Continuation of Ser. No. 104,084, Sep. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 795,977, Nov. 21, 1985, abandoned. This PCT application Nov. 19, 1987, Ser. No. 480,369

Int. Cl.[5] A61K *31/47*

U.S. Cl. 514—312 3 Claims

1. A method for reducing serum glucose levels in an animal, comprising administering an effective amount of a glucose tolerance factor to an animal in need of reduced serum glucose, wherein said glucose tolerance factor has a structural formula selected from the group consisting of:



I II III IV V

4,985,440

HYPOLIPIDAEMIC IMIDAZOL-2-YL-DERIVATIVES OF BICYCLIC COMPOUNDS

Paolo Cozzi; Germano Carganico; Dino Severino; Pierpaolo Lovisolo, all of Milan, and Augusto Chiari, Florence, all of Italy, assignors to Farmitalia Carlo Erba, S.r.l., Milan, Italy

PCT No. PCT/EP89/00233, § 371 Date Dec. 19, 1989, § 102(e) Date Dec. 19, 1989, PCT Pub. No. WO89/08646, PCT Pub. Date Sep. 21, 1989

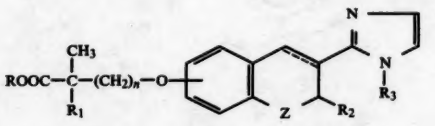
PCT Filed Mar. 7, 1989, Ser. No. 435,429

Claims priority, application United Kingdom, Mar. 9, 1988, 8805628

Int. Cl.[5] A61K *31/415;* C07D *403/00, 233/54*

U.S. Cl. 514—397 9 Claims

1. A compound having the following formula (I)



(I)

wherein

the symbol---- represents a single or double bond;

Z is —O— or —CH_2—;

n is zero, 1, 2 or 3;

each of R and R_1, independently, is hydrogen or C_1–C_4 alkyl;

each of R_2 and R_3, independently, is hydrogen or C_1–C_8 alkyl; or a pharmaceutically acceptable salt thereof.

7. A method of treating a host suffering from dislipidaemia comprising administering thereto an effective amount of a compound of claim 1.

4,985,441

ANTI-TUMOR AGENTS

Leslie R. Hughes, Macclesfield; John Oldfield, Wilmslow, and Stephen J. Pegg, Macclesfield, all of United Kingdom, assignors to Imperial Chemical Industries plc and National Research Development Corp., both of London, England

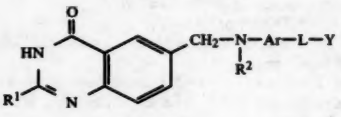
Continuation of Ser. No. 344,095, Apr. 27, 1989, abandoned. This application Apr. 3, 1990, Ser. No. 504,740

Claims priority, application United Kingdom, Apr. 27, 1988, 8809978

Int. Cl.[5] A61K *31/505;* C07D *239/90*

U.S. Cl. 514—260 9 Claims

1. A quinazoline of the formula I



I

wherein R^1 is hydrogen or amino, or alkyl or alkoxy each of up to 6 carbon atoms;

or R^1 is alkyl of up to 3 carbon atoms which bears a hydroxy substituent, or which bears one, two or three fluoro substituents:

or R^1 is hydroxyalkoxy of up to 3 carbon atoms or alkoxyalkoxy of up to 6 carbon atoms;

wherein R^2 is hydrogen, alkyl, alkenyl, alkynyl, hydroxyalkyl or halogenoalkyl each of up to 6 carbon atoms:

wherein Ar is phenylene or heterocyclene which may be unsubstituted or may bear one or two substituents selected from halogeno, hydroxy and amino;

wherein L is a group of the formula —CO.NH— or —CO.NR_3—,

wherein R^3 Is alkyl of up to 6 carbon atoms; and

wherein Y is hydrogen or alkyl, cycloalkyl, alkenyl or alkynyl each of up to 6 carbon atoms; or

Y is a group of the formula —A—Y^1 in which A is alkylene of up to 6 carbon atoms, and Y^1 is hydroxy, amino, nitro, cyano, mercapto or halogeno, or alkoxy, alkylamino, dialkylamino, halogenoalkyl, alkylthio, alkylsulphinyl, alkylsulphonyl or cycloalkyl each of up to 6 carbon atoms;

and provided that, in the group of the formula —L—Y, no constituent methylene or methine group is attached to more than one heteroatom; or a pharmaceutically-acceptable salt thereof.

9. A method for producing an anti-tumour effect in a warm-blooded animal in need of such treatment which comprises administering to said animal an effective amount of a quinazoline of the formula I as claimed in any one of claims 1 to 7, or a pharmaceutically-acceptable salt thereof.

4,985,442

2-SUBSTITUTED-1-NAPHTHOLS AS 5-LIPOXYGENASE INHIBITORS

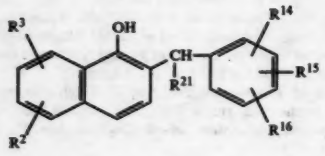
Douglas G. Batt, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 839,912, Mar. 19, 1986, Pat. No. 4,833,164, which is a continuation-in-part of Ser. No. 731,791, May 8, 1985, abandoned. This application Mar. 23, 1989, Ser. No. 327,717

Int. Cl.[5] A61K *31/435;* C07D *211/18, 333/12, 307/10*

U.S. Cl. 514—277 15 Claims

1. A compound having the formula:



(II)

wherein

R^2 and R^3 independently are H, CH_3, C_2H_5, CH_3O, or C_2H_5O;

R^9 is independently H or C_1–C_4 alkyl;

R^{14} is OCH_2COOR^9, or $COOR^9$;

R^{15} and R^{16} are independently H, C_1–C_4 alkyl, OR^9, O-benzyl, F or Cl; and

R^{21} is H, lower alkyl, pyridyl, thienyl, furyl or phenyl optionally monosubstituted with Cl, Br, F, CH_3, or CH_3O.

4,985,443

METHOD AND COMPOSITION FOR TREATING VITILIGO

Leopoldo F. Montes, Buenos Aires, Argentina 1121

Filed Aug. 4, 1989, Ser. No. 389,603

Int. Cl.[5] A61K *31/50, 31/495, 31/505*

U.S. Cl. 514—249 **6 Claims**

1. A method of treating Vitiligo in a human which comprises orally administering to said human capsules or tablets containing between about 2 mg and about 50 mg of folic acid.

4,985,444

PYRAZOLOPYRIDINE COMPOUND AND PROCESSES FOR PREPARATION THEREOF

Youichi Shiokawa, Ibaraki; Atsushi Akahane, Hyogo; Hirohito Katayama, Nishinomiya, and Takafumi Mitsunaga, Ashiya, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

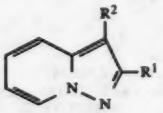
Filed Jan. 18, 1990, Ser. No. 466,929

Claims priority, application United Kingdom, Jan. 23, 1989, 8901423

Int. Cl.[5] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—300 **16 Claims**

1. A pyrazolopyridine compound of the formula:



wherein

R^1 is aryl, and

R^2 is an unsaturated heterocyclic group which contains at least one heteroatom selected from the group consisting of N, O and S, which may have one or more suitable substituent(s),

or a pharmaceutically acceptable salt thereof.

4,985,445

CANCER CELL METASTASIS INHIBITORS AND NOVEL COMPOUNDS

Tsutomu Tsuruoka; Satoru Nakabayashi; Harumi Fukuyasu; Yuuko Ishii; Takashi Tsuruoka; Haruo Yamamoto; Shigeharu Inouye, and Shinichi Kondo, all of Yokohama, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

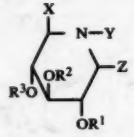
Filed Feb. 6, 1989, Ser. No. 307,387

Claims priority, application Japan, Feb. 12, 1988, 63-31095; Apr. 15, 1988, 63-93673; Apr. 15, 1988, 63-93673; Apr. 19, 1988, 63-97454; Jun. 14, 1988, 63-147815; Jun. 14, 1988, 63-147816

Int. Cl.[5] A61K *31/445;* **C07D** *211/44, 317/34*

U.S. Cl. 514—315 **3 Claims**

1. A compound represented by the formula (I):



(I)

wherein

X is —$COOR^6$ and R^6 is selected from the group consisting of a pivaloyloxymethyl group and a (5-methyl-2-oxo-1,3-dioxole-4-yl)methyl group;

Y is a hydrogen atom;

Z is =O; and

R^1 R^2 and R^3 each are a hydrogen atom.

4,985,446

PIPERIDINE COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS THEREOF

Jorgen Drejer, Bronshoj, Denmark, and Palle Jakobsen, Vaerlose, both of, assignors to A/S Ferrosan, Soborg, Denmark

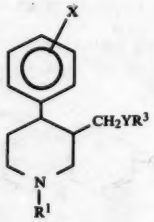
Division of Ser. No. 106,154, Oct. 8, 1987, Pat. No. 4,877,799, and a continuation of Ser. No. 407,208, Sep. 14, 1989, and a continuation of Ser. No. 407,237, Sep. 14, 1989. This application Feb. 28, 1990, Ser. No. 486,252

Claims priority, application Denmark, Nov. 3, 1986, 5232/86; Jun. 25, 1987, 3234/87

Int. Cl.[5] A61K *31/445;* **C07D** *417/12*

U.S. Cl. 514—321 **6 Claims**

1. A piperidine compound selected from those having the formula I



(I)

wherein

R^3 is benzothiazolyl,

R^1 is hydrogen, straight or branched C_{1-8}-alkyl, C_{1-8}-alkoxy-C_{4-8}-alkyl, C_{4-7}-cycloalkyl, up to C_{10}-aryloxy-C_{3-8}-alkyl, C_{1-8}-alkenyl, or C_{4-8}-cycloalkylalkyl,,

X is hydrogen or halogen, and wherein

Y is O or S

and a salt thereof with a pharmaceutically-acceptable acid.

5. (−)-trans-3-(2-benzothiazolylthiomethyl)-4-(4-fluorophenyl)-piperidine hydrochloride.

4,985,447

CERTAIN BENZOQUINONES, NAPHTHOQUINONES AND DERIVATIVES THEREOF WHICH EXHIBIT THROMBOXANE A_2 SYNTHETASE INHIBITION OR RECEPTOR ANTAGONISM AND THE LIKE

Shinji Terao, Osaka, and Kohei Nishikawa, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

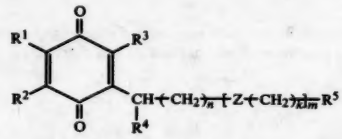
Division of Ser. No. 4,138, Jan. 16, 1987, Pat. No. 4,851,413. This application Apr. 25, 1989, Ser. No. 343,142

Claims priority, application Japan, Jan. 30, 1986, 61-19547; Apr. 23, 1986, 61-94168

Int. Cl.[5] C07D *401/06, 409/06;* A61K *31/44*

U.S. Cl. 514—333 8 Claims

1. A compound of the formula



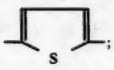
wherein

R^1 and R^2 are the same or different and are methyl or methoxy, or R^1 and R^2 bind together to form —CH=CH—CH=CH—; R^3 is methyl;

R^4 is pyridyl or pyridyl substituted by 1 to 3 substituents selected from the group consisting of alkyl of 1 to 3 carbon atoms, phenyl, p-tolyl, m-tolyl, pyridyl and 3-pyridylmethyl;

R^5 is hydrogen, methyl, hydroxymethyl, methoxymethyl, acetoxymethyl, nitroxymethyl or carbamoyloxymethyl;

Z is



n is an integer from 0 through 12;

m is an integer from 1 through 3; and

k is an integer from 0 through 7,

with the further proviso that, when m is 2 or 3, k may be the same or different in each repeating unit shown in,

or the corresponding hydroquinone derivative thereof.

8. A method for the treatment of a disease due to dysfunction of heart, brain, lung or kidney which comprises administering to a mammal a pharmaceutically effective amount of a compound according to claim 1 or the corresponding hydroquinone derivative thereof.

4,985,448

UREIDOINDOLES, PHARMACEUTICAL COMPOSITIONS AND METHODS FOR ERYTHROCYTE AND THROMBOCYTE AGGREGATION INHIBITION

Harald Zilch, Mannheim; Alfred Mertens, Schriesheim; Wolfgang Von Der Saal, Weinheim; Erwin Boehm, Ladenburg, and Klaus Strein, Hemsbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

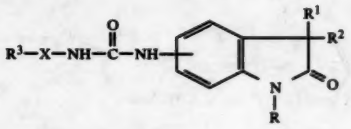
Filed Feb. 6, 1989, Ser. No. 307,417

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 3803775

Int. Cl.[5] A61H *31/44, 31/505, 31/16;* C07D *401/12*

U.S. Cl. 514—339 15 Claims

1. A pharmaceutical composition for inhibition of erythrocyte and thrombocyte aggregation containing an effective amount of at least one compound of the formula:



wherein

R is hydrogen, straight-chained or branched C_1–C_6-alkyl or C_3–C_6-cycloalkyl,

R^1 is hydrogen, C_1–C_6-alkyl, C_2–C_6-alkenyl or C_3–C_7-cycloalkyl,

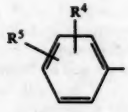
R^2 is a C_1–C_6-alkyl, C_2–C_6-alkenyl, cyano or a carbonyl group substituted by hydroxyl, C_1–C_6-alkyl, C_1–C_6-alkoxy, amino, C_1–C_6-alkylamino, di-C_1–C_6-alkylamino or hydrazino, or

R^1 and R^2 together represent C_2–C_6-alkylidene or C_3–C_6-cycloalkylidene, or

R^1 and R^2, together with the carbon atom to which they are attached, form a C_3–C_7-spirocyclic ring,

X is a valency bond, C_1–C_4-alkylene or C_2–C_4-alkenylene,

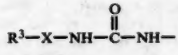
R^3 is a phenyl radical of the formula:



in which R^4 is hydrogen, C_1–C_7-alkanesulphonyloxy, C_1–C_7-alkylsulphonyl, nitro, amino, hydroxyl, C_1–C_7-alkoxy, C_1–C_7-alkyl, C_2–C_7-alkenyloxy, trifluoromethyl, cyano or halogen, and R^5 is hydrogen, chlorine or C_1–C_7-alkoxy, or

R^3 is a pyridyl group or a methylenedioxyphenyl ring

or, when X is a valency bond, R^3 can also be C_1–C_{12}-alkyl, the substituent



being in the 5- or 6-position of the 2,3-dihydroindolin-2-one;

and the optically-active form, tautomer and physiologically acceptable salt thereof, together with pharmaceutically acceptable adjuvant and carrier materials.

4,985,449

N-BENZOYL-N-PYRIDYLOXY PHENYL UREA COMPOUNDS AND PESTICIDE COMPOSITIONS CONTAINING THEM

Takahiro Haga; Tadaaki Toki; Toru Koyanagi; Yasuhiro Fujii; Kiyomitsu Yoshida, and Osamu Imai, all of Kusatsu, Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

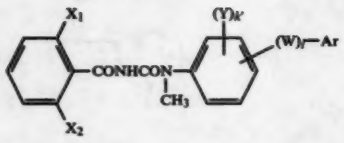
Division of Ser. No. 102,855, Sep. 30, 1987, Pat. No. 4,861,799. This application Jun. 13, 1989, Ser. No. 365,607

Claims priority, application Japan, Oct. 3, 1986, 61-235857; Mar. 11, 1987, 62-56006; Jun. 5, 1987, 62-141214

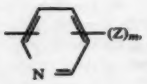
Int. Cl.[5] C07D *213/64;* A01N *43/40*

U.S. Cl. 514—349 9 Claims

1. A benzoylurea compound having the formula:



wherein each of X_1 and X_2 is a hydrogen atom, a halogen atom or a methyl group, provided that X_1 and X_2 are not simultaneously hydrogen atoms, Y is, independently, a hydrogen atom, a halogen atom, a C_1–C_6 alkyl group which may be substituted by halogen, a $—CO_2R_1$ group wherein R_1 is a hydrogen atom, an alkali metal atom, a C_1–C_6 alkyl group, or a $—OR_1$ group wherein R_1 is as defined above, W is an oxygen atom, a sulfur atom or $—NR_1—$wherein R_1 is as defined above, k' is an integer of from 1 to 4, l is 0 or 1, and AR is



wherein Z is independently, a hydrogen atom, a halogen atom, a C_1 –C_6 alkyl group which may be substituted by halogen, a nitro group, a cyano group or a $—S(0)_nR_2$ group, wherein R_2 is a C_1–C_6 alkyl group which may be substituted by halogen, n is 0, 1 or 2, and m' is an integer from 1 to 4, or a salt thereof.

8. A pesticidal composition comprising a pesticidally effective amount of a benzoylurea compound as defined in claim 1, and an agriculturally acceptable adjuvant.

4,985,450

ARYLTHIADIAZOLYLSULFONAMIDES AND DERIVATIVES

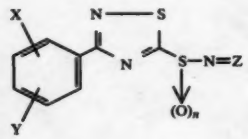
John J. Tegeler, 40 Highland Ave., Bridgewater, N.J. 08807, and Kirk D. Shoger, 16A Rutgers Rd., Piscataway, N.J. 08854

Division of Ser. No. 189,919, May 3, 1988, Pat. No. 4,873,239, which is a division of Ser. No. 8,225, Jan. 29, 1987, Pat. No. 4,758,578. This application Aug. 14, 1989, Ser. No. 393,494

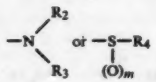
Int. Cl.[5] C07D *285/08;* A61K *31/41*

U.S. Cl. 514—361 60 Claims

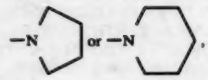
1. A compound having the formula



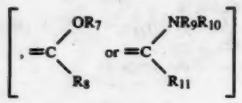
where n is 0, 1 or 2; X and Y are independently hydrogen, loweralkyl, loweralkoxy, aryloweralkyl, aryloxy, halogen, $—CF_3$,$—NO_2$, —OH,$—OCOR_1$,



where R_1 is loweralkyl, aryloweralkyl, aryl or loweralkoxy, R_2 is hydrogen, loweralkyl or loweralkylcarbonyl, R_3 is hydrogen or loweralkyl, or the group $—NR_2R_3$ as a whole is



m is 0, 1 or 2, and R_4 is hydrogen, loweralkyl or aryl; and Z is (R_5, R_6)



where R_5 and R_6 are each independently hydrogen or loweralkyl; or a pharmaceutically acceptable salt thereof.

4,985,451

ELAIOPHYLIN DERIVATIVES, THE USE THEREOF AS PHARMACEUTICALS, AND PHARMACEUTICALS CONTAINING THEM

Peter Hamann, Kelkheim, and Gerhard Kretzschmar, Eschborn, both of Fed. Rep. of Germany, assignors to Hoeschst Aktiengesellschaft, Fed. Rep. of Germany

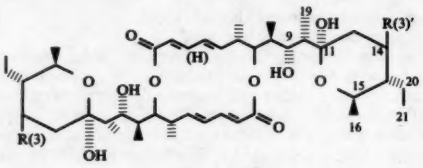
Filed Sep. 15, 1989, Ser. No. 407,617

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1988, 3831695

Int. Cl.[5] A61K *31/41;* C07D *409/00*

U.S. Cl. 514—382 11 Claims

1. A compound I



where the C—C double bonds in the macrodiolide ring of the compound of the formula I can also be hydrogenated, the meanings in this formula I being:

(a) R(3) and R(3)', identical or different, a radical of the formula IV

—SR(4) IV

with R(4) equal to hydrogen, (C_1–C_{10})-alkyl which is unsubstituted or substituted by OH or COOH, (C_2–C_{10})-alkenyl, (C_3–C_8)-cycloalkyl, pyrrolyl, benzopyrrolyl, imidazolyl, benzimidazolyl, triazolyl, tetrazolyl, phenyl, with the aromatic or heteroaryl radicals being unsubstituted or substituted once or twice by (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, (C_1–C_4)-alkylcarbonyl, carboxyl, F, Cl, Br, I, NO_2 or CN,

(b) R(3) L-deoxyfucose and R(3)' as defined under (a),

(c) If the C—C double bonds in the macrodiolide ring are hydrogenated: R(3) and R(3)' hydrogen or R(3) L-deoxyfucose and R(3)' hydrogen.

4,985,452

FUNGICIDAL AGENTS

Wilhelm Brandes, Leichlingen; Gerd Hänssler, Leverkusen; Paul Reinecke, Leverkusen; Hans Scheinpflug, Leverkusen, and Graham Holmwood, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

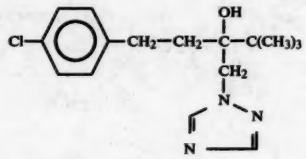
Continuation of Ser. No. 801,550, Nov. 25, 1986, abandoned, which is a division of Ser. No. 646,591, Aug. 31, 1984, abandoned. This application Nov. 20, 1989, Ser. No. 439,897

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1983, 3333411

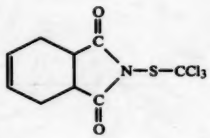
Int. Cl.[5] A01N *43/38, 43/64*

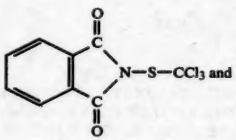
U.S. Cl. 514—383 9 Claims

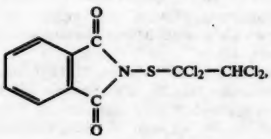
1. A synergistic fungicidal composition comprising (i) a substituted 1-hydroxyethyltriazole of the formula



or an addition product thereof with an acid or metal salt, and (ii) a polyhalogenoalkylthio derivative selected from the group consisting of







wherein the synergistic weight ratio of (i):(ii) is between 1:0.2 and 1:200.

4,985,453

PARABANIC ACID DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS THEREOF

Akira Ishii; Masahiro Yamakawa, and Yoshio Toyomaki, all of Hyogo, Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

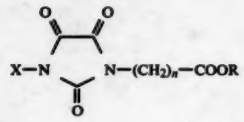
Filed Jul. 26, 1989, Ser. No. 385,123

Claims priority, application Japan, Jul. 29, 1988, 63-190921

Int. Cl.[5] A61K *31/415;* C07D *233/96*

U.S. Cl. 514—386 13 Claims

1. A compound of the formula:



wherein R is hydrogen or a lower alkyl group, X is hydrogen, an alkyl group, a cycloalkyl group, a lower alkylcycloalkyl group, a phenyl group or a phenalkyl group which may be substituted by a lower alkyl group, a lower alkoxy group, a nitro group or a halogen, and n represents an integer of 1 to 4; or a pharmaceutically acceptable salt thereof.

13. A method for treating diabetic complications which comprises administering to a subject in need of such treatment, an effective amount of a compound according to claim 1, or a pharmaceutically acceptable salt thereof.

4,985,454

PROCESS FOR THE PREPARATION OF OPTICALLY-ACTIVE CARBAZOLE DERIVATIVES, NEW R- AND S-CARBAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THESE COMPOUNDS

Herbert Leinert, Heppenheim, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

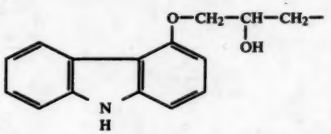
Division of Ser. No. 49,673, May 13, 1987, Pat. No. 4,824,963, which is a division of Ser. No. 612,255, May 21, 1984, Pat. No. 4,697,022. This application Jan. 19, 1989, Ser. No. 299,750

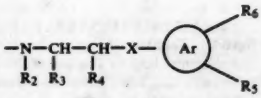
Claims priority, application Fed. Rep. of Germany, May 26, 1983, 3319027

Int. Cl.[5] A61K *31/40;* C07D *209/92, 401/12, 491/056*

U.S. Cl. 514—411 8 Claims

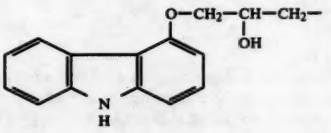
1. An R-(−)-carbazole derivative of the formula



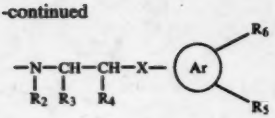


wherein R_2 is hydrogen, lower alkyl, benzyl, phenylethyl or phenylpropyl; R_3 and R_4 are each independently hydrogen or lower alkyl; X is a valency bond, —CH_2—, oxygen or sulfur; Ar is phenyl, naphthyl, indanyl, tetrahydronaphthyl or pyridyl; and R_5 and R_6 are each independently hydrogen, halogen, lower alkyl, aminocarbonyl, hydroxyl, lower alkoxy, benzyloxy, lower alkylthio, lower alkylsulfinyl or lower alkylsulfonyl, or together represent methylenedioxy, or a pharmacologically acceptable salt thereof.

2. An S-(−)-carbazole derivative of the formula



-continued



wherein R_2 is hydrogen, lower alkyl, benzyl, phenylethyl or phenylpropyl; and R_3 and R_4 are each independently hydrogen or lower alkyl; X is a valency bond, $—CH_2—$, oxygen or sulfur; Ar is phenyl, naphthyl, indanyl, tetrahydronaphthyl or pyridyl; and R_5 and R_6 are each independently hydrogen, halogen, lower alkyl, aminocarbonyl, hydroxyl, lower alkoxy, benzyloxy, lower alkylthio, lower alkylsulfinyl or lower alkylsulfonyl, or together represent methylenedioxy, or a pharmacologically acceptable salt thereof.

4,985,455

EXTERNAL PREPARATIONS FREE OF DISCOLORATION

Masahiro Motono, Kurume, Japan, assignor to Sansho Seiyaku Co., Ltd., Fukuoka, Japan

Filed Jul. 25, 1988, Ser. No. 223,590
Int. Cl.[5] A61K *31/35, 7/42, 7/44*
U.S. Cl. 514—460 **9 Claims**

1. A topical composition free of discoloration with the passage of time comprising at least 0.1 weight percent of kojic acid or a derivative thereof; at least 0.01 weight percent of an ultraviolet absorber; at least 0.4 weight percent of β-cyclodextrin; and at least 0.005 weight percent of ethylenediaminetetraacetic acid, said composition having a pH in the range of from 4.0 to 5.0.

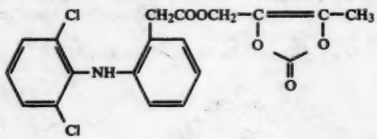
4,985,456

2-ANILINOPHENYLACETIC ACID DERIVATIVE

Keisuke Shimizu, Mie; Takumi Matsumura, and Masato Nakamoto, both of Toyama, all of Japan, assignors to Mikasa Seiyaku Co., Ltd., Tokyo and Daito Koeki Kabushiki Kaisha, Toyoma, both of, Japan

Continuation of Ser. No. 152,810, Feb. 5, 1988, abandoned. This application Feb. 9, 1990, Ser. No. 478,025
Int. Cl.[5] A61K *31/335*; C07D *317/24*
U.S. Cl. 514—467 **2 Claims**

1. (5-methyl-2-oxo-1,3-dioxolen-4-yl)methyl 2-(2,6-dichloroanilino)phenylacetate of the formula:



(I)

2. An anti-inflammatory composition, which comprises: (a) as an essential active ingredient a pharmaceutically effective amount of the compound according to claim 1, and (b) a pharmaceutical inert carrier therefor.

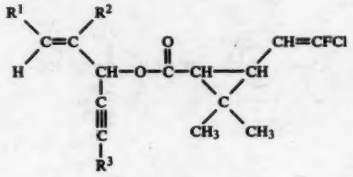
4,985,457

NOVEL CARBOXYLIC ACID ESTERS, METHODS FOR PRODUCING THEM AND INSECTICIDES AND/OR ACARICIDES CONTAINING THEM AS AN ACTIVE INGREDIENT

Hiroko Kishino, Kobe; Noritada Matsuo, Itami; Tohei Takagaki, Takarazuka; Kazunori Tsushima, Sapporo; Toshihiko Yano, and Yoko Torisu, both of Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 31, 1989, Ser. No. 359,395
Claims priority, application Japan, Jun. 3, 1988, 63-138112
Int. Cl.[5] A01N *53/00*
U.S. Cl. 514—531 **8 Claims**

1. A compound represented by the formula,



wherein R^1 represents a C_{1-5} alkyl group, a C_{2-4} alkenyl group or a C_{2-4} alkynyl group; R^2 represents a fluorine atom or a methyl group; and R^3 represents a hydrogen atom.

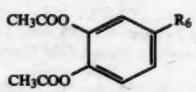
4,985,458

CATECHOL DIACETATE DERIVATIVES FOR INDUCING THE PRODUCTION OF NERVE GROWTH FACTOR TO TREAT DEGENERATIVE DISEASES IN THE CENTRAL NERVOUS SYSTEM

Shigenobu Nakayama, Mihara, and Fumiaki Ikeda, Mobara, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 98,554, Sep. 21, 1987, abandoned. This application Feb. 20, 1990, Ser. No. 481,677
Claims priority, application Japan, Sep. 26, 1986, 61-226135; Dec. 22, 1986, 61-303761; Feb. 20, 1987, 62-035697; May 27, 1987, 62-128444
Int. Cl.[5] A61K *31/235*
U.S. Cl. 514—533 **10 Claims**

1. A pharmaceutical composition for the treatment of regressive disorders of the central nervous system treatable by inducing the production and secretion of nerve growth factor, which comprises a therapeutically effective amount of a catechol represented by the formula (C):



(C)

wherein R_6 is a lower alkyl group having two to five carbon atoms together with a pharmaceutically acceptable carrier or diluent.

4,985,459

ANALGESIC AND ANTI-INFLAMMATORY COMPOSITIONS COMPRISING DIPHENHYDRAMINE AND METHODS OF USING SAME

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Richardson-Vicks, Inc., Shelton, Conn.

Division of Ser. No. 180,570, Apr. 12, 1988, Pat. No. 4,906,625, which is a division of Ser. No. 41,692, Apr. 23, 1987, Pat. No. 4,755,532, which is a division of Ser. No. 856,414, Apr. 28, 1986, Pat. No. 4,683,243, which is a division of Ser. No. 711,525, Mar. 14, 1985, Pat. No. 4,585,783, which is a division of Ser. No. 578,288, Feb. 8, 1984, Pat. No. 4,522,826. This application Oct. 13, 1989, Ser. No. 420,947

Int. Cl.[5] A61K *31/135, 31/195*

U.S. Cl. 514—561 32 Claims

1. A method for eliciting an enhanced analgesic and anti-inflammatory response in a mammalian organism in need of such treatment, comprising administering to such organism

(i) an analgesically and anti-inflammatorily effective amount of mefenamic acid, meclofenamic acid, flufenamic acid, niflumic acid or tolfenamic acid, or a pharmaceutically acceptable salt thereof; and

(ii) an analgesically and anti-inflammatorily potentiating amount of diphenhydramine.

4,985,460

BENZOYLUREA DERIVATIVE AND ITS PRODUCTION AND USE

Noriyasu Sakamoto, Nishinomiya; Tatsuya Mori, Toyonaka; Tadashi Ohsumi, Nishinomiya; Toshihiko Yano, Ashiya; Izumi Fujimoto, Minoo, and Yoji Takada, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 150,990, Feb. 1, 1988, Pat. No. 4,904,696. This application Jul. 28, 1989, Ser. No. 386,159

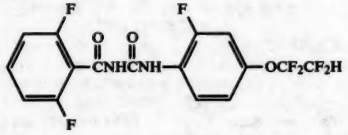
Claims priority, application Japan, Feb. 4, 1987, 62-23975; Aug. 27, 1987, 62-213945

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

Int. Cl.[5] A01N *9/12*

U.S. Cl. 514—594 4 Claims

1. An ovicidal composition for insects which comprises an ovicidally effective amount of a benzoylurea derivative of the formula:



and an inert carrier.

4,985,461

INSECTICIDAL N'-SUBSTITUTED-N,N'-DIACYLHYDRAZINES

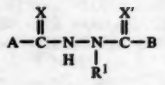
Adam C. Hsu, Lansdale, and Harold E. Aller, Norristown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 21, 1985, Ser. No. 789,797

Int. Cl.[5] A01N *37/18*

U.S. Cl. 514—615 52 Claims

1. A method of controlling insects which comprises contacting the insects with an insecticidally effective amount of a compound having the formula



wherein

X and X' are the same or different O or S;

R^1 is unsubstituted (C_3–C_{10}) branched alkyl or (C_1–C_4) straight chain alkyl substituted with one or two of the same or different (C_3–C_6)cycloalkyl; and

A and B are the same or different unsubstituted naphthyl or substituted naphthyl where the substituents can be from one to three of the same or different halo; cyano; nitro; hydroxy; (C_1–C_4)alkoxy; (C_1–C_4)alkyl; carboxy; (C_1–C_4)alkoxycarbonyl; or (C_1–C_4)alkanoyloxy; or unsubstituted phenyl or substituted phenyl where the substituents can be from one to three of the same or different halo; nitro; cyano; hydroxy; (C_1–C_6)alkyl; (C_1–C_6)haloalkyl; (C_1–C_6)cyanoalkyl; (C_1–C_6)alkoxy; (C_1–C_6)alkoxyalkyl having independently the stated number of carbon atoms in each alkyl group; carboxy; (C_1–C_6)alkoxycarbonyl; (C_1–C_6)alkanoyloxy; sulfhydryl; (C_1–C_6)thiocyanatoalkyl; thiocyanato; (C_1–C_6)alkylthio; sulfinyl; sulfonyl; sulfonate; phenyl or phenoxy; and agronomically acceptable salts thereof.

4,985,462

ALICYCLIC COMPOUNDS AND THEIR CONTRACEPTIVE USE

James A. Baker, Brighton; Stuart L. James, Seaford; Tuncel Ibrahim, Abingdon, and Christopher Marriott, Lewes, all of England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB88/00408, § 371 Date Dec. 4, 1989, § 102(e) Date Dec. 4, 1989, PCT Pub. No. WO88/09786, PCT Pub. Date Dec. 15, 1988

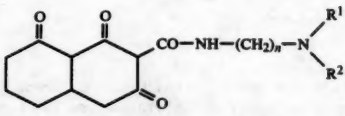
PCT Filed May 24, 1988, Ser. No. 435,479

Claims priority, application United Kingdom, Jun. 2, 1987, 8712948

Int. Cl.[5] A61K *31/16;* C07C *235/32*

U.S. Cl. 514—623 11 Claims

1. Compounds of the general formula



(I)

wherein n is from 1 to 6 and each of R_1 and R_2 represents an alkyl group of 1 to 4 carbon atoms, and their acid addition salts.

9. A method of treating the mammalian body by thickening mucus therein, said method comprising applying to the mammal at the site of the mucus or systematically a mucus-thickening amount of a compound claimed in claim 1.

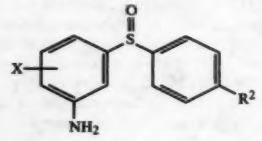
4,985,463

AMINODIARYL SULFOXIDE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL AND PESTICIDAL COMPOSITIONS CONTAINING THEM

János Kreidl; Péter Turcsányi; Zsuzsanna Arcs née Trischler; Béla Stefkó; Judit M. Mészáros née Brill; Ida Deutsch née Juhász; Jenő Szilbereky; Eva Csizér, and Szilárd Vezér, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary

Filed Feb. 28, 1985, Ser. No. 706,707
Claims priority, application Hungary, Feb. 29, 1984, 815/84
Int. Cl.[5] A01N *33/02*
U.S. Cl. 514—646 2 Claims

1. An antifungal or anthelmintic method of treatment which comprises the step of administering to a mammal in need of said treatment a pharmaceutically effective amount of the compound of the Formula (I)



wherein

X is halogen, C_1 to C_6 alkoxy, or a group —NRR^1 in which R and R^1 are each hydrogen or C_1 to C_6 alkyl; and

R^2 is hydrogen, halogen, C_1 to C_6 alkyl, C_1 to C_6 alkoxy, phenyl, phenylthio, or phenyl or phenylthio substituted by at least one halogen, or amino substituent; or a pharmaceutically acceptable acid addition salt thereof.

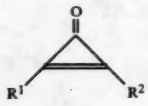
4,985,464

DRUG COMPOSITIONS FOR LOCAL TREATMENT OF ALOPECIA AREATA

Rudolf Happle, Schildstiege 2, D-4400 Münster, and Bjorn Hausen, Wilhelmstrasse 4, D-2082 Tornesch, both of Fed. Rep. of Germany

Continuation of Ser. No. 613,253, May 23, 1984, abandoned, which is a continuation of Ser. No. 362,474, Mar. 26, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,850
Int. Cl.[5] A61K *31/12*
U.S. Cl. 514—679 16 Claims

1. A method of treating alopecia areata which comprises topically applying to the affected skin area a therapeutically effective amount of a cyclopropenone with the general formula:



wherein R^1 and R^2, which can be identical or different groups, represent independently an alkyl group having 1 to 18 carbon atoms; an alkylene group having 3 to 18 carbon atoms and which have 1, 2 or 3 conjugated or isolated C=C bonds; an alkoxy group having 1 to 4 carbon atoms; or a phenyl or a naphthyl group which may be optionally substituted with one or more of halogen, alkyl, monoalkylamino, dialkylamino, or alkoxy groups, the alkyl or alkoxy groups thereof having 1 to 4 carbon atoms.

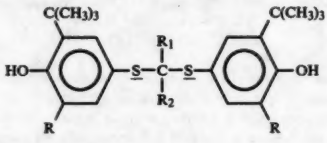
4,985,465

METHOD FOR INHIBITING VIRAL AND RETROVIRAL INFECTIONS

Sheldon S. Hendler, 2159 Avenida de la Playa, La Jolla, Calif. 92037

Filed Jul. 14, 1989, Ser. No. 381,132
Int. Cl.[5] A01N *31/00*; A61K *31/10*
U.S. Cl. 514—712 19 Claims

1. A method of treating viral and retroviral infections in a mammal comprising administering to said mammal an effective amount of an antioxidant of the formula:



wherein R in each occurrence thereof independently represents lower alkyl of from one to four carbon atoms, inclusive: R_1 represents hydrogen or methyl; and R_2 represents methyl, ethyl, propyl, isobutyl, or linear alkyl, up to 20 carbon atoms.

4,985,466

METHOD FOR TREATING TUMORS SUSCEPTIBLE TO TREATMENT WITH REDUCED WOOL ALCOHOL

Hisashi Deguchi, Miyoshi, Japan, assignor to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Jun. 14, 1988, Ser. No. 206,446
Int. Cl.[5] A61K *31/045, 35/12, 35/36*
U.S. Cl. 514—724 1 Claim

1. A method for treating a tumor in an animal having a tumor susceptible to such treatment, which comprises administering to the animal an anti-tumor composition containing, as an active ingredient, an anti-tumor effective amount of a reduced alcohol derived from wool fatty acid or a wool alcohol, said alcohol consisting of branched saturated aliphatic monohydric alcohols having 11 to 17 carbon atoms, and a pharmaceutically acceptable carrier, wherein the weight/weight ratio of the wool alcohol to the carrier is 10^{-6} to 10^2.

4,985,467

HIGHLY ABSORBENT POLYURETHANE FOAM

David J. Kelly, Chester, Pa., and Dai W. Kim, Chatham, N.J., assignors to Scotfoam Corporation, Eddystone, Pa.

Filed Apr. 12, 1989, Ser. No. 336,954
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—52 16 Claims

1. A highly hydrophilic polyurethane article which is the skeletal network of a cellular polyurethane foam subjected to reticulation wherein the polyurethane contains about 1 to 100 parts of a superabsorbent material per hundred parts of polyol used in preparing the polyurethane.

4,985,468

POROUS MATERIAL AND ITS PREPARATION

Alfred R. Elmes; Kevin Hammond, both of Wirral, England, and David C. Sherrington, Kirkintilloch, Scotland, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Apr. 25, 1988, Ser. No. 185,671
Claims priority, application United Kingdom, Apr. 24, 1987, 8709688
Int. Cl.[5] C08J *9/26, 9/28*
U.S. Cl. 521—63 8 Claims

1. A three-dimensional porous polymeric material having a void space consisting of a three-dimensional network of cells separated from each other by walls and interconnected by holes through said walls, the cells having diameters in the range 100 to 0.5 μm, and the void space being in the range 75

to 98% of the total volume of the polymeric material, wherein the polymeric material is a cross-linked polycondensation polymeric material, said polymeric material being formed by a bulk condensation polymerization and condensation cross-linking process occurring in the continuous phase of an emulsion which phase contains polymerizable precursor materials for said polymeric material, the emulsion having an internal phase comprising 75 to 98 volume % of said emulsion material and consisting of globules having dimensions in the range of 100 to 0.5 μm.

4,985,469

POLYMERIC PARTICLES AND THEIR PREPARATION

Gerald K. Chip, Scarborough, and Alfred Rudin, Waterloo, both of Canada, assignors to Tioxide Group, London, England

Filed Dec. 7, 1988, Ser. No. 280,969

Claims priority, application United Kingdom, Dec. 17, 1987, 8729399

Int. Cl.[5] C08J 9/28; C08F 265/04

U.S. Cl. 521—64 14 Claims

1. A core/sheath polymer particle comprising a core of a polymer formed from at least one ethylenically unsaturated monomer containing acid functionality and a hard sheath substantially encapsulating said core, said sheath consisting essentially of a copolymer of a non-ionic monoethylenically unsaturated aliphatic monomer, at least two weight percent of an ester-containing unsaturated monomer selected such that the homopolymer of said ester-containing unsaturated monomer has a glass transition temperature not higher than 15° C. and from 0.25 mole percent of a non-ionically monoethylenically unsaturated aromatic monomer and the glass transition temperature of the copolymer forming said sheath being at least 40° C. and being free of functional acid groups and said particles containing at least one void resulting from a reaction with a non-volatile fixed or permanent base.

4,985,470

PHOTOPOLYMERIZABLE COMPOSITIONS

Hideki Nagasaka, Yamato, and Noriaki Takahashi, Tokyo, both of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Jun. 30, 1986, Ser. No. 880,120

Claims priority, application Japan, Sep. 27, 1982, 57-168088

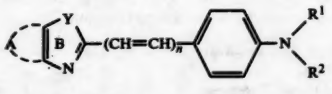
Int. Cl.[5] G03F 7/031, 7/032, 2/50, 4/40

U.S. Cl. 522—26 17 Claims

1. A photopolymerizable composition, which comprises:

the combination of an addition-polymerizable compound having at least one ethylenically unsaturated double bond and a photopolymerization initiator system consisting essentially of:

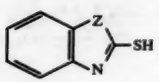
(a) a p-dialkylaminostyrene derivative or p-dialkylaminophenylbutadiene derivative of the formula:



wherein R^1 and R^2 each independently is an alkyl group, Y is a divalent atom or member selected from the group consisting of —O—, —S— and —CH=CH— and forms an aromatic heterocyclic ring B together with the trivalent nitrogen atom, and ring A represents a benzene ring or naphthalene ring condensed with ring B, and n is 1 or 2;

(b) a hexaarylbiimidazole; and

(c) a thiol compound of the formula:



wherein Z represents a divalent atom or member selected from the group consisting of —O—, —S—, —NH— and

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4,985,471

RADIATION CURABLE PRESSURE SENSITIVE ADHESIVE COMPOSITION

Tomohisa Ohta, Tochigi; Hiroyuki Hagiwara, Shimodate; Hisashige Kanbara, Shimodate; Akihiko Dobashi, Shimodate, and Yasuyuki Seki, Hitachi, all of Japan, assignors to Hitachi Chemical Company Ltd., Tokyo, Japan

Filed Apr. 19, 1988, Ser. No. 183,633

Claims priority, application Japan, Apr. 20, 1987, 62-97199

Int. Cl.[5] C08F 2/46

U.S. Cl. 522—27 8 Claims

1. A radiation curable pressure sensitive adhesive composition comprising:

(A) 100 parts by weight of a hydrogenated 1,2-polybutadiene liquid oligomer which has one or more ethylenically unsaturated terminal radicals in its molecule and in which 70% or more of intramolecular carbon-carbon double bonds has been hydrogenated, said one or more ethylenically unsaturated terminal radicals being attached at both terminals of a main chain of the hydrogenated 1,2-polybutadiene liquid oligomer and the main chain of the hydrogenated 1,2-polybutadiene liquid oligomer being prepared by living anionic polymerization;

(B) from 0.2 to 20 parts by weight of a chain transfer agent selected from the group consisting of ethylene glycol bis(thioglycolate), 1,4-butanediol bis(thiopropionate), trimethylolpropane tris(thioglycolate), trimethylolpropane tris(β-thiopropionate), and pentaerythritol tetrakis(β-thiopropionate); and

(C) from 0.001 to 1.0 parts by weight of a thermal polymerization inhibitor selected from metal complexes of N-nitrosophenylhydroxylamine.

4,985,472

ACTINIC RAY CURABLE COMPOSITION FOR CASTING POLYMERIZATION AND CASTING POLYMERIZATION MOLDED PRODUCTS

Fumito Aosai, Nagoya; Hiroshi Fukushima, Kasugai, and Hisako Hado, Ogaki, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

PCT No. PCT/JP88/00432, § 371 Date Nov. 7, 1988, § 102(e) Date Nov. 7, 1988, PCT Pub. No. WO88/08434, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 28, 1988, Ser. No. 273,338

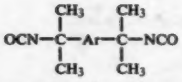
Claims priority, application Japan, May 1, 1987, 62-108662; Jun. 4, 1987, 62-140521; Jul. 6, 1987, 62-168493; Dec. 11, 1987, 62-313267; Feb. 15, 1988, 63-32564; Feb. 15, 1988, 63-32565

Int. Cl.[5] C08G 18/10

U.S. Cl. 522—64 8 Claims

1. An actinic ray curable composition for casting polymerization which comprises:

(A) 40–90 parts by weight of an urethane poly(meth)acrylate having at least two (meth)acryloyl groups in one molecule, obtained by addition reaction of a hydroxyl group-containing (meth)acrylate and a polyisocyanate represented by the general formula (IV)

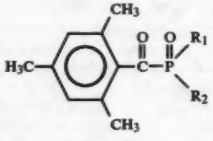


(IV)

(wherein Ar represents a phenyl group, a biphenyl group, a naphthylene group or a diphenylmethane group),

(B) 10–60 parts by weight of a radical polymerizable vinyl monomer having a boiling point of 100° C. or higher, being at least one monofunctional monomer selected from benzyl (meth)acrylate, phenyl (meth)acrylate, phenoxyethyl (meth)acrylate, biphenyl (meth) acrylate and cyclohexyl (meth)acrylate and/or at least one polyfunctional monomer selected from ethylene glycol di(meth)acrylate, diethylene glycol di(meth)acrylate, triethylene glycol di(meth)acrylate, tetraethylene glycol di(meth)acrylate, pentaethylene glycol di(meth)acrylate, 1,3-butylene glycol di(meth)acrylate, dipropylene glycol di(meth)acrylate, tetrapropylene glycol di(meth)acrylate, 2,2 -bis(4-(meth)acryloxydiethoxyphenyl)propane, 2,2'-bis(4-(meth-)acryloxydiethoxyphenyl)propane, 2,2'-bis(4-(meth)acryloxypentaethoxyphenyl)propane, 2,2'-bis(4-(meth)acryloxyethoxy-3,5-dibromophenyl)propane, 2,2'-bis(4-(meth)acryloxydiethoxy-3,5-dibromophenyl)propane and 2,2'-bis(4-(meth)acryloxypentaethoxy-3,5-dibromophenyl)propane, and

(C) 0.01 to 0.1 parts by weight, per 100 parts by weight of total of the above components (A) and (B), of at least one member selected from methylphenyl glyoxylate, 2-hydroxy-2-methyl-1-phenylpropane-1-one, hydroxycyclohexyl phenyl ketone and a photo-initiator represented by the general formula (I):



(I)

(wherein R_1 and R_2 which may be identical or different each represents a phenyl group, a methoxy group, an ethoxy group or an isopropyloxy group).

4,985,473

COMPOSITIONS FOR PROVIDING ABHERENT COATINGS

Brian Howard Williams, White Bear Lake, and Chung-I Young, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

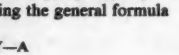
Continuation of Ser. No. 907,141, Sep. 12, 1986, abandoned, which is a continuation of Ser. No. 311,274, Oct. 14, 1981, abandoned, which is a division of Ser. No. 151,644, May 20, 1980, Pat. No. 4,321,404. This application May 17, 1988, Ser. No. 195,483

Int. Cl.[5] C08F *251/02, 265/06, 279/06, 291/18*

U.S. Cl. 522—89 **14 Claims**

1. A radiation curable composition for providing solvent-resistant abhesive coatings comprising:

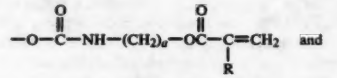
(A) a poly(fluorooxyalkylene)acrylate or methacrylate compound having the general formula



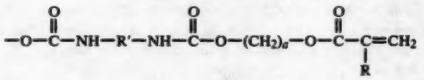
wherein

R_f^2 is a divalent poly(fluorooxyalkylene) group having a number average molecular weight of from about 500 to 20,000;

A is selected from the group consisting of



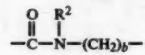
and



wherein:

R is selected from the group consisting of hydrogen and methyl, a is an integer having a value of 2 to 6, and R' is selected from the group consisting of a divalent aliphatic or cycloaliphatic group having 2 to 14 carbon atoms and an aryl group having 6 to 14 carbon atoms;

Y is selected from the group consisting of —CH_2— and



wherein:

b is 2 to 12, R^2 is selected from the group consisting of hydrogen, a lower alkyl of about 1 to 4 carbon atoms, and —CH_2—$_c$A, wherein A is defined as said A hereinabove, c is 2 or 3, and wherein, when R^2 is —CH_2—$_c$A, b is 2 or 3; and

Z is selected from the group consisting of CF_3O—, $CF_3OCF(CF_3)O$—, and —Y—A, wherein Y and A are defined as said Y and A hereinabove;

(B) a polyethylenically unsaturated crosslinking agent which differs from said poly(fluorooxyalkylene) acrylate or methacrylate compound; and

(C) 50 to 85 percent by weight of a nonfluorinated, non-moisture reactive thermoplastic film-forming polymer;

wherein all fluorine present in said composition is provided by said poly(fluorooxyalkylene) acrylate or methacrylate compound which is present in said composition in a concentration of between about 0.2 and 5 percent by weight of said composition.

4,985,474

HARDENABLE RESIN COMPOSITION

Osamu Ogitani, Koshigaya, and Ryuichi Fujii, Urawa, both of Japan, assignors to Somar Corporation, Japan

Filed Nov. 13, 1989, Ser. No. 434,263

Claims priority, application Japan, Nov. 16, 1988, 63-289819

Int. Cl.[5] C08L *33/08, 33/10*

U.S. Cl. 522—107 **11 Claims**

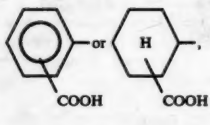
1. A resin composition hardenable by irradiation of a high energy ray, comprising the following ingredients (a) through (d):

(a) a resin selected from the group consisting of rosins and modified rosins and having an acid value of at least 150 and a Gardner color scale of not greater than 15;

(b) a compound of the general formula (I):

(I)

wherein Y represents



A represents an alkylene having 1–4 carbon atoms, R represents hydrogen or methyl and m is an integer of 1–4;

(c) a hydroxyl group-containing compound having only one acrylic or methacrylic group and at least one hydroxyl group; and

(d) 1–30 wt. %, based on the total weight of the composition, of glycerin or a diol which is liquid at room temperature.

4,985,475

ENCAPSULANT COMPOSITIONS FOR USE IN SIGNAL TRANSMISSION DEVICES

Thomas S. Croft, and Hartwick Haugen, both of Austin, Tex., assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

Continuation-in-part of Ser. No. 19,295, Mar. 9, 1987, Pat. No. 4,857,563. This application Nov. 25, 1988, Ser. No. 274,337

Int. Cl.[5] H02G *15/00*

U.S. Cl. 523—173 **17 Claims**

1. A grease compatible, hydrolytically stable dielectric encapsulant capable of being used to encapsulate a splice of a signal conducting device comprising:

an extended reaction product of an admixture of

(a) an effective amount of an anhydride functionalized compound having reactive anhydride sites;

(b) an effective amount of a crosslinking agent that reacts with the anhydride sites of said compound to form a cured cross-linked material; and

(c) an effective amount of an oxirane containing material to provide hydrolytic stability;

wherein said reaction product is extended with at least one plasticizer present in the range of between 5 and 95 percent by weight of the encapsulant and said at least one plasticizer is essentially inert with said reaction product and is substantially non-exuding therefrom; and

said encapsulant having a C-H adhesion value of at least 4.

4,985,476

RTV 1K COMPOSITIONS WHICH ARE STABLE IN STORAGE IN THE ABSENCE OF MOISTURE AND FORM ELASTOMERS WHICH CAN BE PAINTED

Robert Endres, Bergisch-Gladbach; Wilhelm Weber, and Krystyna Preuss, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Oct. 17, 1989, Ser. No. 422,681

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1988, 3836916

Int. Cl.[5] C08K *9/10*

U.S. Cl. 523—210 **14 Claims**

1. A polydiorganosiloxane composition which is stable in storage with exclusion of moisture and which is curable with water or atmospheric air at ambient temperature to produce elastomers with a low modulus and high elongation and ultimate strength, said composition comprising a mixture of a α,ω-dihydroxypolydiorganosiloxane, a carboxylic acid amido alkylalkoxy silicon compound as cross-linking agent, a titanium chelate of a lower alkyl acid ester and a precipitated, hydrophobicized chalk whose residual moisture has been removed before contact with the chelate and cross-linking agent in the mixture.

4,985,477

METHOD OF PRODUCING TREATED SILICA FILLER FOR SILICONE RUBBER

Warde T. Collins; Kenneth R. Cottrell, and John C. Saam, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 193,626, May 13, 1988, abandoned. This application Aug. 30, 1989, Ser. No. 401,607

Int. Cl.[5] C08K *9/06*

U.S. Cl. 523—212 **31 Claims**

1. A method of rapidly treating the surface of reinforcing silica filler consisting essentially of mixing, at a temperature of from about −10° to 130° C.,

(A) 100 parts by weight of reinforcing silica filler, having a surface area of greater than 50 m^2/g, and having from 0.5 to 6 parts by weight of absorbed moisture,

(B) from 3 to 30 parts by weight of volatile treating agent of the formula $R_xSi(OR')_{4-x}$, wherein R is a alkyl, alkenyl, or aryl radical having from 1 to 6 carbon atoms which may be substituted with halogen atoms, R′ is an alkyl radical having from 1 to 3 carbon atoms, x is 1 or 2, and R and R′ are chosen so that the vapor pressure of the alkoxysilane exceeds 10 Pa at treatment temperature,

(C) from 0.001 to 5.0 parts by weight of volatile catalyst selected from the group consisting of base B, and mixtures of acid A and base B, wherein acid A is a volatile acid or acid progenitor, and base B is a silylamine or silazane, acid A and base B being chosen so that the vapor pressure of either acid A or base B exceeds 500 Pa at treatment temperature, for a period of time sufficient to allow the desired amount of treating agent to be adsorbed onto the surface of the particulate filler,

to yield a filler which requires a minimum of energy to disperse rapidly into polydiorganosiloxane and which gives improved properties to cured silicone elastomers.

4,985,478

THERMOSETTING RESIN COMPOSITION

Masao Kameyama, and Shigeyuki Kumagawa, both of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 29, 1988, Ser. No. 250,613

Claims priority, application Japan, Sep. 30, 1987, 62-244247

Int. Cl.[5] C08L *79/08;* **C08K** *7/28, 7/14*

U.S. Cl. 523—219 **15 Claims**

1. A thermosetting resin composition which comprises (a) a preliminary reaction product between a polyamino compound and an unsaturated bismaleimide compound, (b) an epoxy group-containing vinyl compound, (b′) dibromo neopentylglycol diglycidyl ether, (c) an epoxy curing agent and (d) a radical polymerization initiator as indispensable components, said preliminary reaction product as the component (a) being formed by a preliminary reaction conducted substantially in the absence of the epoxy group-containing vinyl compound as the component (b).

4,985,479

STABILIZED POLYOLEFIN COMPOSITION

Hideo Nagasaki; Shinichi Yachigo, both of Osaka; Takeshi Takata; Hiroki Yamamoto, both of Hyogo, and Yukoh Takahashi, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 124,763, Nov. 23, 1987, abandoned. This application Mar. 28, 1989, Ser. No. 329,764

Claims priority, application Japan, Nov. 27, 1986, 61-283232; Sep. 14, 1987, 62-230401

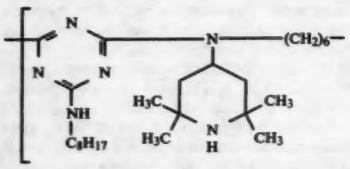
Int. Cl.[5] C08K *5/34, 5/53, 5/09*

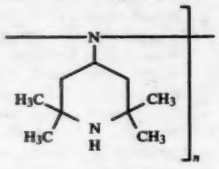
U.S. Cl. 524—96 **14 Claims**

1. A polyolefin composition comprising a polyolefin and, per 100 parts by weight of the polyolefin,

(A) 0.01 to 1 part by weight of a hindered piperidine compound having a molecular weight of more than 750, said hindered piperidine compound being selected from the group consisting of a compound having a repeating unit of

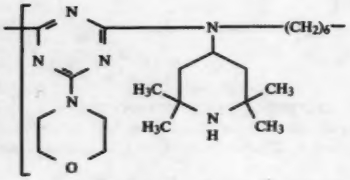
(A-1)

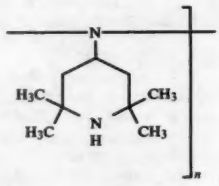




wherein n is an integer of 2 to 20, a compound having a repeating unit of

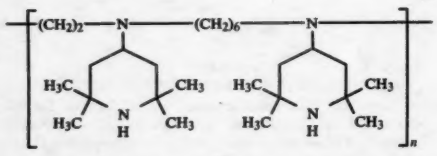
(A-2)





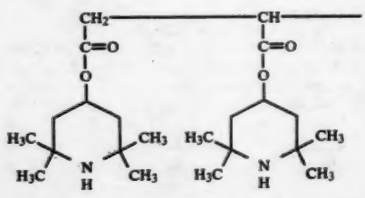
wherein n is an integer of 2 to 20, a compound having a repeating unit of

(A-3)



wherein n is an integer of 2 to 20, and a compound of

(A-4)



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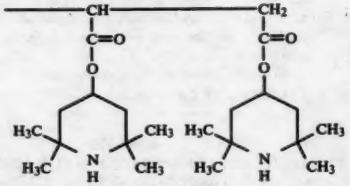
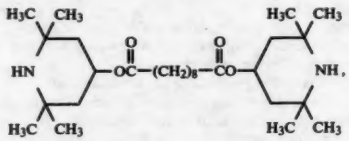
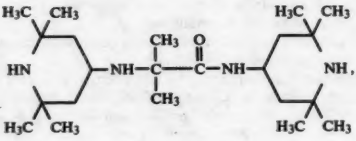


(B) 0.01 to 1 part by weight of a hindered piperidine compound having a molecular weight of less than 500, said hindered piperidine compound being selected from the group consisting of

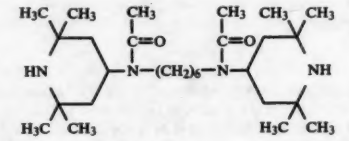
(B-1)



(B-2)

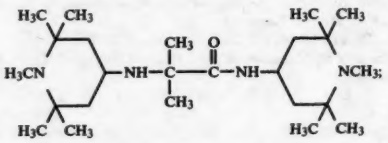


(B-3)



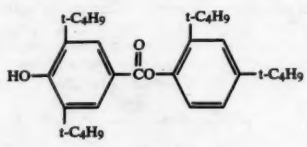
and

(B-4)



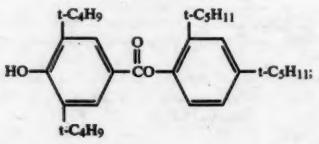
(C) 0.01 to 1 part by weight of a benzoate compound selected from the group consisting of

(C-1)



and

(C-2)



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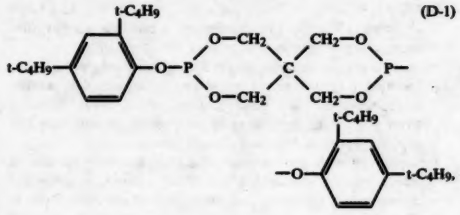
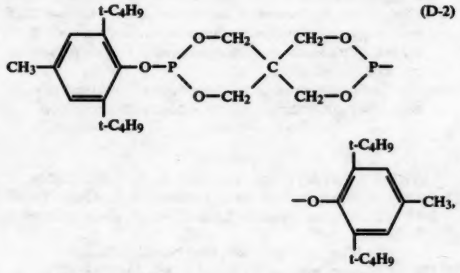
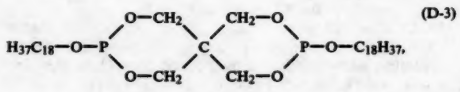
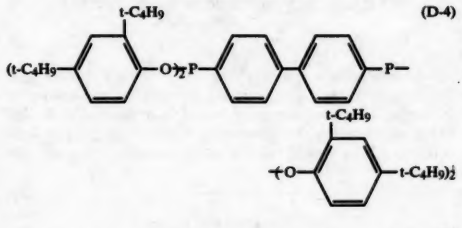
and

(D) 0.01 to 1 part by weight of a phosphorus-containing compound selected from the group consisting of

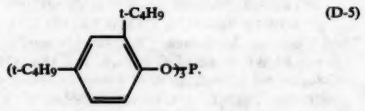

(D-1)


(D-2)

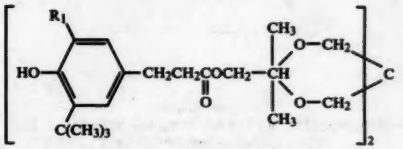

(D-3)


(D-4)

and

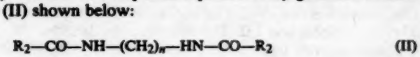

(D-5)

(a) 100 parts by weight of a polyolefin,
(b) 1–100 parts by weight of an inorganic filler,
(c) 0.01–1.0 part by weight of a phenolic antioxidant represented by general formula (I) shown below:


(I)

wherein R, represents an alkyl group of 1–3 carbon atoms, and

(d) at least one compound represented by general Formula (II) shown below:


(II)

wherein R_2 represents an alkyl group or an alkenyl group of 5–21 carbon atoms, and n is an integer of 1 to 6.

4,985,480

INORGANIC FILLER CONTAINING POLYOLEFIN COMPOSITION

Yoshiharu Fukui, and Kazuhisa Kuroda, both of Chiba, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed May 8, 1989, Ser. No. 348,418
Claims priority, application Japan, May 9, 1988, 63-113390
Int. Cl.[5] C08K *5/15*
U.S. Cl. 524—108 **4 Claims**

1. An inorganic filler-containing polyolefin composition which comprises

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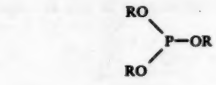
4,985,481

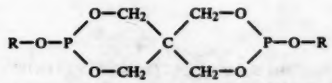
SOLID STABILIZER COMPOSITION FOR SYNTHETIC POLYMERS

Carlo Neri, San Donato Milanese; Nereo Nodari, Spino d'Adda, and Giovanni Sandre, San Donato Milanese, all of Italy, assignors to Enichem Synthesis, S.p.A., Palermo, Italy

Continuation of Ser. No. 158,388, Feb. 22, 1988, abandoned. This application Sep. 19, 1989, Ser. No. 409,271
Claims priority, application Italy, Mar. 3, 1987, 19550 A/87
Int. Cl.[5] C08K *5/524, 5/526;* C09K *15/32*
U.S. Cl. 524—120 **14 Claims**

1. A process for preparing a solid composition, resistant to hydrolyze and useful as a stabilizer in synthetic polymers, comprising the following steps taken before admixture of the composition with the polymers: (a) blending 2,2'-oxamido-bis-(ethyl-3-(3,5-ditert.-butyl-4-hydroxyphenyl)-propionate) with organic phosphite, said organic phosphite, said organic phosphite being selected from the group consisting of compounds having the formulas:


(I)


(II)

and

(III)

wherein R may be the same or different and is selected from alkyl, cycloalkyl, aryl, alkaryl or aralkyl radicals unsubstituted or substituted with alkyl, cycloalkyl, aryl, alkaryl or aralkyl radicals: (b) heating said blend of step (a) to a molten mass; and (c) rapidly cooling said molted mass to about room temperature, to thereby form a composition comprising a solid continuous phase and a solid phase dispersed in said continuous phase, wherein the continuous phase is constituted by said 2,2'-oxamido-bis(ethyl-3-(3,5-di-tert.-butyl- 4-hydroxyphenyl)-pro-

pionate) in amorphous form and the dispersed phase is constituted by said organic phosphite in amorphous, or crystalline, or partially amorphous and partially crystalline form, and wherein the weight ratio of said continuous phase to said dispersed phase is from 9:1 to 1:9.

4,985,482

COMPOSITION FOR GUMMING MINERAL FIBERS AND GUMMED MINERAL FIBERS

Charles de Goys de Mezeyrac, Gif-sur-Yvette; Roger Fugier, Rantigny; Bernard Giquel, St-Brice Sous Foret, and Serge Tetard, Nogent Sur Oise, all of France, assignors to Isover Saint-Gobain, Courbevoie, France

Continuation of Ser. No. 917,223, Oct. 9, 1986, abandoned. This application Jul. 27, 1989, Ser. No. 385,996

Claims priority, application France, Oct. 9, 1985, 85-14943

Int. Cl.[5] C08L *61/28*; C09D *161/28*; C09J *161/28*

U.S. Cl. 524—215 14 Claims

11. A sizing composition for mineral fibers, comprising an aqueous resin composition obtained by the condensation, in basic medium, of formaldehyde (F), urea (U), and melamine (M) in the presence of a polymethylol compound having a functionality of at least 3, said resin having a water tolerance of at least 1000% at room temperature, wherein:

the molar ratio (F/M) of the number of moles of formaldehyde relative to the number of moles of melamine is between:

$$\left(0.5\frac{U}{M}+1.5\right) \text{ and } \left(3\frac{U}{M}+3\right); \text{ and}$$

the molar ration U/M of the number of moles of urea relative to the number of moles of melamine is between 0.5 and 5; and

the amount of polymethylol compound is between 0.2 and 2 moles per mole of melamine,

said composition containing additional urea and at least one sizing additive selected from the group consisting of ammonium sulfate, aminosilane, mineral oil and ammonia.

4,985,483

FLUORORUBBER COMPOSITION CONTAINING DISPERSED PARTICLES OF CURED SILICONE MATERIAL

Masayuki Saito, Gunma; Keiji Yoshida, and Mitsuo Hamada, both of Chiba, all of Japan, assignors to Toray Silicone Company Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 313,123, Feb. 21, 1989, abandoned. This application Sep. 22, 1989, Ser. No. 411,136

Claims priority, application Japan, Oct. 17, 1988, 63-260925

Int. Cl.[5] C08K *5/24*

U.S. Cl. 524—265 8 Claims

1. In a fluororubber composition comprising (A) 100 weight parts of a curable fluororubber and (B) a quantity of a curing agent sufficient to cure the fluororubber,

the improvement comprising the presence of

(C) from 0.1 to 30 weight parts of a finely divided cured silicone material in the form of a rubber, gel or resin, where said silicone material exhibits an average particle diameter not exceeding 100 micrometers.

4,985,484

PROCESS FOR THE PRODUCTION OF COATING COMPOSITIONS CONTAINING MICROCAPSULES

Noble H. Yoshida, and John Brabender, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 27, 1989, Ser. No. 315,959

Int. Cl.[5] C08L *75/02*

U.S. Cl. 524—379 12 Claims

1. A process for the preparation of a coating composition containing microcapsules comprising the steps of:

(a) preparing an aqueous dispersion of microcapsules,

(b) adding a flow control agent to said aqueous dispersion microcapsules, said flow control agent being selected from the group consisting of propylene glycol, ethylene glycol, glycerol, butanediol, and pentane diol,

(c) applying heat and vacuum to said aqueous dispersion of microcapsules containing said flow control agent while continuously metering said dispersion of microcapsules to a wiped film evaporator and continuously forming a thin film of said dispersion of microcapsules on the walls of said evaporator to remove water from said dispersion of microcapsules and thereby concentrate said dispersion of microcapsules, and

(d) adding said concentrated dispersion of microcapsules to a printing ink vehicle to form a coating composition.

4,985,485

FIRE-RESISTANT POLYAMIDE COMPOSITIONS

Yves Bonin, Brignais, and Jack LeBlanc, Saint-Genis Laval, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Oct. 13, 1989, Ser. No. 421,058

Claims priority, application France, Oct. 13, 1988, 88 14298

Int. Cl.[5] C08K *5/30, 5/26*

U.S. Cl. 524—403 9 Claims

1. A composition of matter comprising a major amount of a polyamide, a fire-resisting amount of red phosphorus therefor, at least one lanthanide-based compound, and an effective amount of at least one hydrotalcite having the general formula:

$$Mg_{(1-a)}Al_a(OH)_2A_{a/2}\cdot pH_2O \quad (I)$$

in which A is the anion SO_4^{2-} or CO_3^{2-}; a is a number such that $O<a\leqq 0.5$; and p is a number representing the number of molecules of water per molecule of hydrotalcite, such that $O<p<1$, wherein the amount of hydrotalcite ranges from 0.1% to 5% by weight relative to the weight of said polyamide.

4,985,486

REINFORCED/FILLED BLENDS OF THERMOPLASTIC INTERPOLYMERS AND POLYAMIDES AND A PROCESS FOR THEIR PRODUCTION

Uwe Westeppe, Mettmann; Christian Lindner, Cologne; Karl-Erwin Piejko, Bergisch-Gladbach, and Hans-Joachim Laue, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 3, 1989, Ser. No. 389,758

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827668

Int. Cl.[5] C08K *3/10, 3/26, 3/34*; C08L *33/34*

U.S. Cl. 524—514 16 Claims

1. Filled and/or reinforced thermoplastic molding compositions having an improved surface and improved mechanical or electrical properties which comprise:

(AE) at least 10% by weight polyamides (A) which contains from 10 to 65% by weight fillers and/or reinforcing materials (E),

(C) from 0 to 30% by weight based, on the sum of (A+C+D), of rubber polymers as high impact modifiers, and

(D) from 10 to 60% by weight interpolymers consisting of

from 40 to 80% by weight of amorphous or partially crystalline polyamides (A) and

(B) from 20 to 60% by weight of thermoplastic copolymers or mixtures of several thermoplastic copolymers of

(B1) at least 15% by weight of at least one monomer selected from the group consisting of

(B1.1) styrenes and α-methylstyrenes which are unsubstituted or substituted by alkyl, haloalkyl or halogen, and

(B1.2) from 0 to 50% by weight of other monomers selected from the group consisting of acrylonitrile, methacrylonitrile, vinyl-C_{14}-carboxylic acids and acryl ester which are esters of acrylic or methacrylic acids with primary secondary C_{1-10} alcohols, and

(B2) from 0.5 to 35% by weight of at least one ester of acrylic or methacrylic acid with tertiary C_{4-10} alcohols,

prepared by homogenization of component (B) with polyamide (A) in the melt in mixing or kneading units.

4,985,487

ZWITTERION POLYMERS

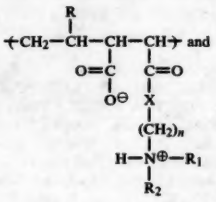
Jenn S. Shih, Paramus, and Terry E. Smith, Morristown, both of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Jan. 11, 1990, Ser. No. 463,710

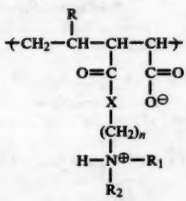
Int. Cl.[5] C08F *8/32*

U.S. Cl. 524—548 **7 Claims**

1. Zwitterion polymers having the formulas:



and



where

R is OR', where R' is C_1–C_8 alkyl or a lactam,

X is oxygen or nitrogen,

n is 2–10, and

R_1 and R_2 are each independently C_1–C_8 alkyl, and mixtures thereof.

4,985,488

PRESSURE-SENSITIVE ADHESIVE HAVING IMPROVED ADHESION TO PLASTICIZED VINYL SUBSTRATES

Donald T. Landin, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 196,441, May 20, 1988, Pat. No. 4,946,742. This application Apr. 16, 1990, Ser. No. 509,219

Int. Cl.[5] C09J *7/02*; B32B *27/04, 27/22*

U.S. Cl. 524—555 **7 Claims**

1. Normally tacky and pressure-sensitive adhesive having outstanding ability to bond to plasticized vinyl substrates and to remain firmly bonded thereto even after remaining in contact therewith for extended periods of time, comprising:

a copolymer of 100 parts of monomers consisting essentially of 60–88 parts of acrylic acid ester of non-tertiary 4–14 carbon alkyl alcohol, 2–30 parts of polar nitrogen-containing vinyl monomer, and 0–12 parts of vinyl carboxylic acid, said copolymer being intimately blended with 2–35% of plasticizer based on said copolymer,

the adhesive being characterized by having a 180° peel adhesion to plasticized vinyl cable jacketing of at least 48 N/dm after being adhered thereto for three days at room temperature, and at least 31 N/dm after being adhered thereto for one week at 70° C.

4,985,489

PRODUCTION OF ARTICLES OF BONDED PARTICULATE MATERIAL AND BINDER COMPOSITIONS FOR USE THEREIN

Sidney A. Barker; Neil Baggett, both of Birmingham; John Stevenson; Raymond D. George, both of Sutton Coldfield; David R. De Courcy, Birmingham; Timothy Hammond, Stockton-on-Tees, and Martin Bradley, Solihull, all of United Kingdom, assignors to Foseco International Limited, Birmingham, United Kingdom

Division of Ser. No. 280,313, Dec. 6, 1988. This application Sep. 29, 1989, Ser. No. 409,724

Claims priority, application United Kingdom, Dec. 24, 1987, 8730159; Jul. 8, 1988, 8816106

Int. Cl.[5] C08L *61/06, 8/28*; C08K *3/38, 5/56*

U.S. Cl. 524—594 **26 Claims**

1. A process for the production of an article of bonded particulate material comprising the steps of:

(a) forming to a desired shape a mixture comprising particulate material and a binder comprising an alkaline aqueous solution of a resol phenol-aldehyde resin and an oxyanion capable of forming a stable complex with the resin, the amount of alkyl present in the solution being sufficient to solubilize the resin and to prevent a stable complex formation between the resin and the oxyanion, and the amount of oxyanion present being sufficient to cure the resin when stable complex formation is permitted to take place; and

(b) passing carbon dioxide gas through the formed shape to reduce the alkalinity of the solution so as to cause the oxyanion to form a stable complex with the resin and thereby to cure the resin.

4,985,490

METHOD OF DIRECT MANUFACTURE OF PIGMENTED POLYURETHANE POWDER

James W. Rosthauser, Imperial, Pa.; Walter Meckel, Neuss, and Werner Rasshofer, Koeln, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany and Mobay Corporation, Pittsburgh, Pa.

Filed Apr. 12, 1989, Ser. No. 336,978

Int. Cl.[5] C08K *3/22*

U.S. Cl. 524—871 **26 Claims**

1. A process for the direct production of a pigmented thermoplastic polyurethane powder in finely divided form which comprises

(a) reacting with agitation at an overall equivalent ratio of isocyanate groups to isocyanate reactive groups of about 0.5 to 1.1

(i) a surfactant-stabilized emulsion of fine droplets of a first reactant which has an average of about two isocyanate or isocyanate reactive groups in admixture with at least one pigment with

(ii) a second reactant which contain an average of about two isocyanate or isocyanate reactive groups,

in an inert organic liquid in which said first reactant, said pigment and said powder are substantially insoluble or immiscible to form particles of said powder which are protected from agglomeration by the surfactant, and

(b) separating the particles of said powder from said inert organic liquid.

4,985,491

POLYURETHANE SEALANTS MADE USING HIGH MOLECULAR WEIGHT POLYOLS PREPARED WITH DOUBLE METAL CYANIDE CATALYSTS

John W. Reisch, Guilford, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Oct. 5, 1989, Ser. No. 417,356
Int. Cl.[5] C08L *75/04*
U.S. Cl. 524—875 12 Claims

1. A polyurethane sealant composition made by reacting an isocyanate-terminated prepolymer with a chain extender, said isocyanate-terminated prepolymer being the reaction product of a polyisocyanate and a polyether triol having a molecular weight of between about 5,000 and about 30,000, said triol having an end group unsaturation level of no greater than 0.04 milliequivalents per gram of triol.

4,985,492

POLYPHENYLENE ETHER MOLDING COMPOSITIONS

Dieter Wittmann, Cologne; Thomas Eckel, Dormagen; Karl-Heinz Ott, Leverkusen; Volker Damrath, Burscheid, and Uwe Westeppe, Remscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 21, 1989, Ser. No. 341,215
Claims priority, application Fed. Rep. of Germany, May 3, 1988, 3814973
Int. Cl.[5] C08G *63/48*
U.S. Cl. 525—63 8 Claims

1. Thermoplastic molding compositions comprising:

A. 1 to 99 parts by weight of a polyphenylene ether resin and

B. 1 to 99 parts by weight of a graft polymer comprising 5 to 90% by weight of a mixture, B.1, grafted on 10 to 95% by weight of a silicone rubber, B.2, and

C. 0 to 80 parts by weight per 100 parts A+B of a thermoplastic polymer of 60 to 100% by weight of an aromatic alkenyl compound, C.1, and 0 to 40% by weight of an other α, β-unsaturated compound, C.2, copolymerizable with C.1,

wherein

B.1 comprises a mixture of 60 to 100% by weight of an aromatic alkenyl compound, B.1.1, and 0 to 40% by weight of an other α, β-unsaturated compound, B.1.2, copolymerizable with B.1.1, and

B.2 is a silicone rubber substituted with C_1–C_6 alkyl or cyclohexyl radicals, C_6–C_{12} aryl radicals, C_1–C_6alkenyl radicals, mercapto-C_1-C6-alkyl radicals or mixtures thereof, wherein 2 to 10 mol-% of said radicals are i. C_1–C_6 alkenyl and ii. mercapto-C_1–C_6-alkyl groups, the molar ratio of i:ii being 3:1 to 1:3, said rubber having an average particle diameter d_{50} of 0.05 to 1 μm and a gel content of more than 50% by weight.

4,985,493

THERMOPLASTIC MOULDING COMPOUNDS WITH LOW TEMPERATURE TOUGHNESS OBTAINED FROM AROMATIC POLYESTER CARBONATES AND SPECIAL GRAFT POLYMERS

Thomas Eckel, Dormagen; Dieter Wittmann, Cologne; Edgar Leitz, Dormagen; Jochen Schoeps, Krefeld; Karl-Heinz Ott, and Horst Peters, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 3, 1989, Ser. No. 389,326
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827642
Int. Cl.[5] C08L *69/00, 51/04*
U.S. Cl. 525—67 15 Claims

1. Thermoplastic moulding compounds consisting essentially of

A. from 5–99 parts by weight of a fully aromatic polyester carbonate and

B. from 1–60 parts by weight of a graft polymer of

B.1 from 5–90 parts by weight of a mixture of

B.1.1 from 20–99 parts by weight of methyl methacrylate and

B.1.2 from 1–40 parts by weight of an acrylic acid ester of a primary or secondary monohydric aliphatic C_2–C_{10} alcohol in which the sum of the parts by weight of B.1.1 and B.1.2 amounts to 100 parts by weight, on

B.2 from 10–95 parts by weight of a cross-linked diene rubber having an average particle diameter d_{50} of from 0.05 to 1 μm and a gel content of more than 50% by weight, based on the weight of B.2

in which the sum of the parts by weight of A and B is 100.

4,985,494

THERMOPLASTIC MOLDING COMPOSITIONS, AND A PROCESS FOR THE PRODUCTION THEREOF

Ralf Schueler, Recklinghausen; Joachim Muegge, Haltern; Michael Droescher, Dorsten; Wilfried Bartz, and Roland Feinauer, both of Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Division of Ser. No. 333,281, Apr. 5, 1989, Pat. No. 4,923,926.
This application Feb. 21, 1990, Ser. No. 482,493
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818871
Int. Cl.[5] C08L *69/00*
U.S. Cl. 525—67 12 Claims

1. A thermoplastic molding composition comprising:

70 to 98 parts of an aromatic polycarbonate having a viscosity number of from 40 to 100 cm^3/g,

2 to 30 parts of a polyoctenylene or a modified polyoctenylene containing functional groups, and, based on 100 parts of polycarbonate, from 20 to 80 parts of a polyester having a viscosity number of 80 to 240 cm^3/g of an aromatic dicarboxylic acid with a dihydric aliphatic alcohol.

4,985,495

RESIN COMPOSITION

Takeyoshi Nishio, Okazaki; Shinichi Yamauchi, Yokkaichi; Yusuke Arashiro, Yokkaichi; Kenyu Ohno, Yokkaichi; Masuzo Yokoyama, Yokkaichi; Hiroshi Nakano, Yokkaichi; Hiroshi Ohmori, Yokkaichi; Junji Mayumi, Yokkaichi, and Michiharu Kihira, Yokkaichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi and Mitsubishi Petrochemical Co., Ltd., Tokyo, both of, Japan

Filed Dec. 23, 1988, Ser. No. 289,035
Claims priority, application Japan, Dec. 25, 1987, 62-329060
Int. Cl.[5] C08L *49/00, 53/00, 71/12*
U.S. Cl. 525—68 12 Claims

1. A resin composition consisting essentially of the following components (a), (b) and (c):

(a) 30 to 70 parts by weight of a resin comprising 40 to 100

wt% of a polyphenylene ether resin and 0 to 60 wt% of a styrene resin;

(b) 30 to 70 parts by weight of a crystalline propylene resin; and

(c) 1 to 40 parts by weight of a modified propylene-dialkenylbenzene compound copolymer with respect to a total of 100 parts by weight of said components (a) and (b) which is polymerized by using a Ziegler-Natta catalyst and obtained by subjecting an alkenyl aromatic monomer to copolymerization with a copolymer whose dialkenylbenzene compound content is 0.001 to 10 wt% in the presence of a polymerization initiator.

4,985,496

THERMOPLASTIC RESIN COMPOSITION

Kazuo Kishida, Tokyo, Japan; Kiyokazu Kitai, Westfield, N.J., and Masaaki Mohri, Ohtake, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Jun. 15, 1989, Ser. No. 366,653

Claims priority, application Japan, Jun. 15, 1988, 63-145629

Int. Cl.[5] C08L *35/06, 51/04*

U.S. Cl. 525—74 **11 Claims**

1. A thermoplastic resin composition, comprising:

(A) a graft copolymer obtained by emulsion-graft-polymerizing 5 to 20% by weight of an alkyl methacrylate having 1 to 4 carbon atoms in the alkyl group and 5 to 60% by weight of an aromatic vinyl monomer selected from the group consisting of styrene, α-substituted styrenes and nucleus-substituted styrenes in the presence of 40 to 80% by weight (as solids) of a diene type rubber polymer latex containing at least 50% by weight of a diene type rubber polymer having a weight average particle diameter of at least 0.3 μm, and

(B) a copolymer of an α,β-unsaturated cyclic anhydride and an aromatic vinyl compound, the ratio of the graft copolymer (A) to the copolymer (B) being 1/99 to 40/60 by weight.

4,985,497

THERMOPLASTIC BLENDS CONTAINING ETHYLENE TERPOLYMERS AND THE PREPARATION THEREOF

Kathryn A. Kamins, Hockessin, Del., and Robert J. Statz, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 25, 1988, Ser. No. 236,441

Int. Cl.[5] C08L *55/02, 101/06*

U.S. Cl. 525—84 **4 Claims**

1. A toughened multi-phase thermoplastic blend comprising:

(a) 90–96 weight percent based on total blend of acrylonitrile/butadiene/styrene resin; and

(b) 4–10 weight percent based on total blend of a terpolymer comprising 40–79 weight percent of polymer repeat units of ethylene, 15–40 weight percent of polymer repeat units of n-butyl acrylate and 6–20 weight percent of polymer repeat units of carbon monoxide having a melt flow index of 0.1–100 g/10 minutes, the blend having a flex modulus of at least 1,700 MPa.

4,985,498

PROCESS OF FORMING FILMS FROM BLENDS OF LINEAR LOW DENSITY ETHYLENE COPOLYMERS

Pradeep P. Shirodkar, Somerset, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 384,361, Jul. 25, 1989, Pat. No. 4,921,911, which is a continuation-in-part of Ser. No. 266,957, Nov. 3, 1988, Pat. No. 4,957,972, which is a continuation-in-part of Ser. No. 295,430, Jan. 10, 1989, Pat. No. 4,957,969. This application Nov. 13, 1989, Ser. No. 435,106

Int. Cl.[5] C08L *23/18, 23/20, 51/04;* **C08J** *5/18*

U.S. Cl. 525—86 **13 Claims**

1. A process of extruding into a blown film a polymer blend comprising a linear low density copolymer of ethylene with an olefin containing 4 to 10 carbon atoms and minor amounts of an at least partially isotactic, partially crystalline butene-1 polymer comprising at least about 80 wt.% of polymerized butene-1, and an ABS resin, based on the total polymer content of the blend.

4,985,499

PRESSURE SENSITIVE ADHESIVE COMPOSITION

Makoto Nishikawa; Hideo Takamatsu; Masao Ishii, and Shobu Minatono, all of Kashima, Japan, assignors to Kuraray Company Ltd., Kurashiki, Japan

Filed Feb. 14, 1989, Ser. No. 310,052

Claims priority, application Japan, Feb. 22, 1988, 63-40279

Int. Cl.[5] C09J *153/02;* **C08L** *53/02*

U.S. Cl. 525—89 **8 Claims**

1. A pressure sensitive adhesive composition which comprises (a) a tri-block copolymer which consists of aromatic vinyl block-conjugated diene blockaromatic vinyl block and whose conjugated diene moiety is hydrogenated and (b) a block copolymer of the following formula

$$(D\text{-}S)_N\text{-}D$$

which consists of an aromatic vinyl block and a conjugated diene block and whose conjugated diene moiety is hydrogenated and in which S is an aromatic vinyl block, D is a conjugated diene block and N is an integer of from 1 to 5.

4,985,500

PRIMER COMPOSITIONS

Shosaku Yamamoto, and Kazuo Kakinuma, both of Yokohama, Japan, assignors to Nippon Oil and Fats Co., Ltd., Japan

Continuation of Ser. No. 3,238, Jan. 14, 1987, Pat. No. 4,830,778. This application May 23, 1988, Ser. No. 197,149

Claims priority, application Japan, Jan. 23, 1986, 61-11152

Int. Cl.[5] C08F *8/30*

U.S. Cl. 525—123 **1 Claim**

1. A primer composition consisting essentially of

(A) at least one resin having a glass transition temperature of not higher than −20° C. and an elongation at break of not less than 400% at 20° C., said resin being selected from the group consisting of polyolefin resin, polyacrylic resin, polyester resin, and modified resins thereof comprising linear high molecular weight elastomers; and

(B) at least one cross linking resin selected from the group consisting of melamine resin, urea resin, polyisocyanate resin and block isocyanate resin;

wherein a weight ratio as a solid resin content of component (A) to component (B) is 70-99:30-1.

4,985,501

POLYBLENDS OF THERMOPLASTIC COPOLYESTERS AND STYRENIC/UNSATURATED DICARBOXYLIC ACID ANHYDRIDE COPOLYMERS

Kishore Udipi, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 20, 1989, Ser. No. 453,850

Int. Cl.[5] C08L *67/02*

U.S. Cl. 525—173 **14 Claims**

1. A thermoplastic molding composition comprising:

(a) from 95 to 70% by weight based on the total weight of (a) and (b) of a copolyester of a dicarboxylic acid moiety, at least 50 mole percent of which is terephthalic acid, and a dihydric alcohol moiety, at least 50 mole percent of which is ethylene glycol, and from 20 to 50 mole percent of which is diethylene glycol of 1,4-cyclohexanedimethanol, the copolyester having a glass transition temperature (Tg) of about 40° to 85° C. and an inherent viscosity (I.V.) of about 0.2 to 10; and

(b) from 5 to 30% by weight based on the total weight of (a) and (b) of a copolymer prepared utilizing 45 to 83% by weight based on the weight of the copolymer of a styrenic

monomer 55 17% by weight based on the weight of the copolymer of an unsaturated dicarboxylic acid anhydride; and optionally from 0 to 20% by weight based on the weight of the copolymer of an alkyl (meth)acrylic ester wherein the alkyl group contains 1 to 3 carbon atoms;

wherein the T Transmittance of the molding composition is 80.00 minimum.

4,985,502

THERMOPLASTIC ELASTOMER

Zenichiro Izumi; Shigeru Kurosawa, and Rika Akiyoshi, all of Oita, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Dec. 22, 1989, Ser. No. 455,016

Claims priority, application Japan, Dec. 23, 1988, 63-327482; Aug. 2, 1989, 1-200884

Int. Cl.[5] C08L *23/26, 23/16, 23/04, 23/10*

U.S. Cl. 525—194 **9 Claims**

1. A thermoplastic elastomer which is a cured product prepared by treating a composition comprising (a) 45 to 90 parts by weight of a rubbery component and (b) 10 to 55 parts by weight of a polyolefin resin, based on 100 parts by weight of the sum of the components (a) and (b), with a curing agent; said rubbery component (a) comprising, based on the weight of the rubbery component, 5 to 100% by weight of an ethylene-propylene copolymer rubber having an ethylene content of 60 to 78% by mole, a crystallinity of 4 to 20% as determined by the X-ray diffractometry, a maximum peak temperature of melting of at least 100° C., a melt flow index (MFI) at 230° C. of less than 0.01, a high-load melt flow index (HLMFI)/melt flow index (MFI) ratio of at least 35, a weight average molecular weight (Mw)/number average molecular weight (Mn) ratio of at least 4, and a tensile strength at break of at least 100 kg/cm^2, and 95 to 0% by weight of an ethylene-propylene-nonconjugated diene copolymer; and said rubbery component (a) in the cured product having a gel content of more than 80% by weight and less than 97% by weight as determined by immersion in cyclohexane at 23° C. for 48 hours.

4,985,503

PREPARATION OF IMPACT-RESISTANT POLY(ALKYL)STYRENE

Klaus Bronstert, Carlsberg; Hans Hoenl, Obersuelzen; Adolf Echte, Ludwigshafen, and Peter Klaerner, Battenberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 30,483, Mar. 27, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 338,556

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1986, 3611705

Int. Cl.[5] C08L *9/00, 51/04*

U.S. Cl. 525—193 **4 Claims**

1. Impact-resistant translucent rubbermodified polystyrene or poly(alkyl)styrene as obtained by a twostage process comprising polymerizing, in a first stage, a batch consisting of 70 to 97% by weight of styrene, ring-alkylated styrene, side-chain-alkylated styrene or a mixture thereof and 3 to 30% at least one rubbery polymer conforming to the formula p-(S)$_x$, where x denotes the number of thiol groups per rubber molecule and is an integer from 1 to 5 and P is a polymer of more than 80% conjugated dienes of 4 or 5 carbon atoms, and having an average molecular weight, as measured by gel permeation chromatography, in the range from 20,000 to 200,000 in the presence of heat or in the presence of free radical initiators, with stirring in the absence of a solvent for from 3 to 6 hours, to a conversion of from 20 to 40%, based on the monomer, stirring being carried out in such a way that thereafter the flexible component dispersed in the polystyrene has a median particle diameter of from 0.1 to 0.8 μm, and, in a second stage, dispersing the product thus obtained, after the addition of a free radical initiator, in an aqueous phase which contains suspending assistants and buffer salts, polymerization being effected in the course of from 5 to 15 hours to a conversion of from 95 to 99.95%, based on the monomer.

4,985,504

COMPATIBLE POLYMER BLENDS

Werner Siol, Darmstadt-Eberstadt, Fed. Rep. of Germany, assignor to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 357,264

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818837; Sep. 22, 1988, 3834599

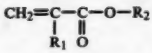
Int. Cl.[5] C08L *39/04, 37/00, 41/00*

U.S. Cl. 525—204 **36 Claims**

1. A compatible miscible polymer blend, consisting essentially of:

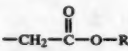
(A) 0.1–99.9 wt % of a first polymer P1, said first polymer comprising 20–100 wt. % styrene monomer units; and

(B) 99.9–0.1 wt % of a second polymer P2, wherein said second polymer comprises 30–100 wt. % of monomers having formula I

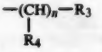


(I)

wherein R_1 is hydrogen, methyl or the group



and wherein R_2 and R_2' are the group



wherein n is 0–3, R_3 is a 5–8 membered heterocyclic ring having at least two heteroatoms in the ring, at least one of said heteroatoms being an oxygen, and R_4 is a hydrogen or a C_{1-6} alkyl group.

4,985,505

PROCESS OF DISPERSION POLYMERIZATION OF BUTADIENE IN PROPANE OR BUTANE

Binnur Z. Gunesin, New York, N.Y., and Paul A. Pindris, Red Bank, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 44,688, May 1, 1981, abandoned. This application Jun. 19, 1989, Ser. No. 370,104

Int. Cl.[5] C08F *297/04*

U.S. Cl. 525—250 **31 Claims**

1. A process for the dispersion polymerization of at least two monomers, wherein the first monomer is styrene or an alkylstyrene and the second monomer is a conjugated diene, to a block polymer containing at least 25 weight percent of the diene comprising conducting the polymerization under superatmospheric pressure with an anionic polymerization catalyst in a dispersing medium consists essentially of propane, n-butane or isobutane, and a hydrogenated styrene or an alkylstyrene/isoprene block copolymeric dispersing agent effective to provide a stable dispersion, and recovering the block polymer product.

4,985,506

OXIDATIVELY CROSS-LINKABLE, WATER DILUTABLE BINDERS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Harald Blum, Wachtendonk; Peter Höhlein, Kempen; Michael Sonntag, Odenthal, and Wolfgang Wellner, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 26, 1989, Ser. No. 371,262

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1988, 3822995

Int. Cl.[5] C08F *8/42*

U.S. Cl. 525—298 5 Claims

1. Oxidatively cross-linkable, water dilutable binders which consist essentially of a modified co-polymer of olefinically unsaturated compounds, having a molecular weight range of from 6000 to 160,000 as determined by gel permeation chromatography, and having

(a) for each 100 g of solids content, a total of from 60 to 250 milliequivalents of chemically incorporated carboxyl groups, of which from 10 to 100% have been neutralized thereby rendering the product dilutable in water and from 15 to 50% by weight of pendant ester moieties corresponding to the formula

wherein R represents an olefinically monounsaturated or polyunsaturated aliphatic hydrocarbon having a molecular weight above 166 and containing from 12 to 22 carbon atoms.

4,985,507

ELASTOMER COMPOSITION

Nobuyuki Yoshida; Hisao Tanaka, both of Ichihara, and Masahiro Fukuyama, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 15, 1989, Ser. No. 351,663

Claims priority, application Japan, May 26, 1988, 63-128623

Int. Cl.[5] C08F *8/00*

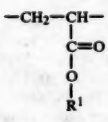
U.S. Cl. 525—387 16 Claims

1. A vulcanizable elastomer composition comprising:

100 parts by weight of a copolymer containing

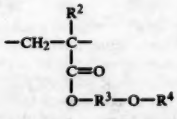
(A) 50–85% by mole of ethylene unit,

(B) 10–45% by mole of an alkyl acrylate unit having the formula (I),



wherein R^1 is an alkyl having 1–8 carbon atoms, and

(C) 2–35% by mole of an alkoxyalkyl acrylate unit having the formula (II),



wherein R^2 is hydrogen or methyl, R^3 is an alkylene having 1–4 carbon atoms, and R^4 is an alkyl or alkoxyalkyl, each having 1–4 carbon atoms, and 0.1–10 parts by weight of an organic peroxide.

4,985,508

PROCESS FOR THE PRODUCTION OF POLYESTER-POLYAMIDE BLOCK POLYMERS

Bernhard Müssig, Seevetal; Rolf-Volker Meyer, Krefeld; Rolf Dhein, and Bert Brassat, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 41,156, Apr. 22, 1987, abandoned, which is a continuation of Ser. No. 797,933, Nov. 14, 1985, abandoned, which is a continuation of Ser. No. 676,526, Nov. 30, 1984, abandoned, which is a continuation of Ser. No. 594,722, Mar. 29, 1984, abandoned. This application Apr. 11, 1989, Ser. No. 336,579

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 3312580

Int. Cl.[5] C08G *81/00*

U.S. Cl. 525—420.5 6 Claims

1. Thermoplastically processable polyamide-polyester block polymers produced by a process consisting of

(i) precondensing polyamide-forming components until a relative viscosity of at least 1.2, measured on a 1% polymer solution in meta-cresol at 25° C., is attained;

(ii) adding from 1 to 30%, by weight, based on the total mixture, of a polyester component having a molecular weight of from 2,000 to 20,000 which is the average molecular weight determined by end group analysis, and being obtained from reactants consisting of diol and dicarboxylic acid wherein the diol is selected from the groups consisting of ethylene glycol, 1,2-and 1,3-propanediol, 1,4-butane diol, neopentyl glycol, 1,5-pentanediol, 1,6-hexanedioal, 1,10-decanediol, 1,4-di-(methylol)-cyclohexane, 12-hydroxystearyl alcohol and TCD-dimethanol of the formula

and the dicarboxylic acid is selected from the group consisting of reaction products of an unsaturated fatty acid with another fatty acid or its ester, hydrogenated reaction products of an unsaturated fatty acid with another fatty acid or its ester, reaction products of an unsaturated fatty acid with CO, hydrogenated reaction products of an unsaturated fatty acid with CO, reaction products of an unsaturated fatty acid with an α,β-unsaturated monocarboxylic acid, and hydrogenated reaction products of an unsaturated fatty acid with an α,β-unsaturated monocarboxylic acid;

(iii) and then completely polycondensing the mixture.

4,985,509

HEAT CURABLE RESIN COMPOSITION

Hidekazu Matuura; Yasuo Miyadera, both of Shimodate, and Toshihiko Kato, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

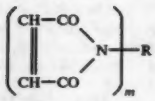
Continuation of Ser. No. 33,267, Apr. 2, 1987, abandoned. This application May 12, 1989, Ser. No. 352,659

Claims priority, application Japan, Apr. 18, 1985, 60-83095; Apr. 2, 1986, 61-76107

Int. Cl.[5] C08L *79/08*

U.S. Cl. 525—426 5 Claims

1. An unsupported film-shaped adhesive consisting essentially of a heat curable resin composition comprising (A) a polyimide produced by using as a diamine component 90 to 30% by mol of bis sulfone and 10 to 70% by mol of 2,4-diamino-toluene and as an acid component 3,3',4,4'-benzophenone-tetracarboxylic dianhydride in substantially equimolar amounts, and (B) a polymaleimide of the formula:



wherein R is a hydrocarbon group having a valence of 2 or more or a diphenoxy group; and m is an integer of 2 or more.

4,985,510

CRYSTALLINE N-METHOXYMETHYLATED NYLON AND NYLON COMPOSITION

Setsuo Akiyama, Sagamihara; Hisanobu Monobe, Yokohama; Kazuo Naito, Kawasaki; Toshio Honda, Akigawa, and Kazuo Tanaka, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,821

Claims priority, application Japan, Jul. 30, 1987, 62-191299; Jul. 30, 1987, 62-191300

Int. Cl.[5] C08G *69/48, 69/50*

U.S. Cl. 525—427 12 Claims

1. A crystalline N-methoxymethylated nylon having an endothermic peak temperature of at least 165° C. based on crystal melting when heated at a rate of 10° C./min.

which is prepared by adding about 0.5 to 15 parts by weight of an acid to 100 parts by weight of an N-methoxymethylated nylon to form a mixture and heat treating the mixture to crystallize the N-methoxymethylated nylon,

wherein the acid is selected from the group consisting of citric acid, tartaric acid, glutaric acid, lactic acid, itaconic acid, azelaic acid, succinic acid, glycolic acid, crotonic acid, hypophosphorous acid, lauric acid, chloroacetic acid, boric acid and mixtures thereof, and

wherein the heat treating is carried out at a temperature of from about 40° C. to 180° C. for about 30 seconds to 30 days.

4,985,511

SILOXANE-POLYPIVALOLACTONE THERMOPLASTIC ELASTOMERS

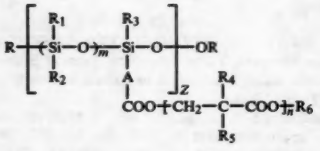
Kenneth B. Wagener, Gainesville, Fla., and Sirisoma Wanigatunga, Bridgewater, N.J., assignors to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 236,731, Aug. 26, 1988, abandoned. This application Jun. 8, 1989, Ser. No. 362,937

Int. Cl.[5] C08F *283/00*

U.S. Cl. 525—474 14 Claims

1. A poly(siloxane-pivalolactone) thermoplastic elastomer having the formula:



wherein:

R is H, —$(CH_2)_x$—COOH, —CH=CH_2, CH_3, C_6H_5, —C≡CH,

CF_3 or —$(CH_2)_xNH_2$,

X is an integer in the range of from about 1 to about 3,

R_1 and R_2 may be the same or different and are lower alkyl, aryl, —CH=CH_2,

—$(CH_2)_yNH_2$, CF_3 or $CONH_2$,

m is an integer in the range of from about 1 to about 50,000,

R_3 is lower alkyl, aryl, —CH=CH_2,

or —$(CH_2)_y$—NH_2,

A is alkylene having from 2 to 10 carbon atoms,

R_4 and R_4 may be the same or different and are lower alkyl, aryl, —CH=CH_2,

—$(CH_2)_nNH_2$, CF_3, —$CONH_2$

R_6 is H, —CH_3—C_2H_5,

y is an integer in the range of from about 1 to about 3,

n is an integer in the range of from about 1 to about 50,000;

z is an integer in the range of from 1 to about 5000; or a salt thereof.

4,985,512

HIGH-LUBRICITY FILM

Yo Iizuka; Ken Kashiwadate; Toshio Hosokawa; Shunzo Endo; Takayuki Katto, all of Iwaki; Toshiya Mizuno, Tsuchiura, and Kenichi Katase, Ushiku, all of Japan, assignors to Kureha Kagaku Kogyo K. K., Japan

Filed Oct. 25, 1988, Ser. No. 262,304

Claims priority, application Japan, Nov. 5, 1987, 62-278277

Int. Cl.[5] C08L *81/06;* B29B *7/26*

U.S. Cl. 525—537 8 Claims

1. A high-lubricity film obtained by biaxially stretching a resin composition which has been obtained by radical polymerization of 3–25 parts by weight of a monomer component composed of at least 70 weight percent styrene monomer in the presence of 100 parts by weight of particles of a straight-chain poly(arylene sulfide) having a melt viscosity of at least 1,000 poises.

4,985,513

CONJUGATED DIENE COPOLYMER, PROCESS FOR PRODUCING THE SAME, AND PHOTOSENSITIVE RESIN COMPOSITION COMPRISING THE SAME

Shin-ichiro Iwanaga; Tatsuaki Matsunaga; Ituo Nishiwaki, all of Yokkaichi, and Hiroji Enyo, Suzuka, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Division of Ser. No. 124,870, Nov. 24, 1987, Pat. No. 4,927,738. This application Apr. 11, 1989, Ser. No. 336,112

Claims priority, application Japan, Dec. 26, 1986, 61-308133

Int. Cl.[5] C08F *220/20, 220/06, 236/04;* G03F *7/033*

U.S. Cl. 526—80 26 Claims

1. A conjugated diene copolymer comprising (A) 40–90 mole percent of a conjugated diene component, (B) 0.5–10 mole percent of an α, β-ethylenically unsaturated carboxylic acid component, (C) 0.1–5 mole percent of a polyfunctional alkenyl compound component not in component (A) and selected from the group consisting of esters of polyhydric alcohols with acrylic and methacrylic acids, divinylbenzene and trivinylbenzene and (D) 5–58 mole percent of a monoolefinically unsaturated compound component other than one from component (B), wherein the intrinsic viscosity of the copoly-

mer is 0.01–3.0 dl/g as measured at 30° C. in dimethylformamide, the width (ΔTg) of the endothermic transition temperature section of the copolymer, as measured by differential scanning calorimetry is 45°–120° C. and the limit temperature (T_1) on the lower temperature side of the endothermic transition temperature section is −40° C. or less, and

wherein said copolymer is prepared by polymerizing a monomer mixture of (a) 30–90% by weight of said conjugated diene monomer, (b) 0.5–10% by weight of said α,β-ethylenically unsaturated carboxylic acid monomer, (c) 0.1–10% by weight of said polyfunctional alkenyl compound monomer and (d) 5–65% by weight of said monoolefinically unsaturated compound monomer, wherein (a)+(b)+(c)+(d)=100% by weight, in the presence of a radical polymerization initiator, wherein all of component (a) is initially added, and 20–100% by weight of the above amount of component (b), 20–80% by weight of the above amount of component (c) and 0–50% by weight of the above amount of component (d) are post-added at one time or continuously when the polymerization conversion of the initially added monomers has reached 20–85%.

4,985,514

METHOD FOR PRODUCTION OF WATER ABSORBENT RESIN

Kazumasa Kimura, Osaka; Takumi Hatsuda; Yoshio Irie, both of Himeji, and Tadao Shimomura, Toyonaka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Aug. 9, 1988, Ser. No. 229,988

Claims priority, application Japan, Aug. 10, 1987, 62-198233; Aug. 10, 1987, 62-198234

Int. Cl.[5] C08F *2/10, 20/06*

U.S. Cl. 526—88 **24 Claims**

1. A method for the production of a water absorbent resin, which comprises preparing a monomer component possessing an ability to form a cross-linked structure and convert itself into a hydrated gel polymer during the course of aqueous solution polymerization, possessing an acid group-containing monomer content of at least 50 mol %, and having 10 to 50 mol % of said acid group-containing monomer neutralized and subjecting said monomer component to aqueous solution polymerization within a reaction vessel having a plurality of rotary stirring shafts each fitted with stirring blades.

4,985,515

PROCESS FOR POLYMERIZATION OF α-OLEFIN

Mitsuyuki Matsuura, and Takashi Fujita, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 84,835, Aug. 13, 1987, abandoned. This application Jul. 17, 1989, Ser. No. 381,997

Claims priority, application Japan, Aug. 18, 1986, 61-192519

Int. Cl.[5] C08F *4/654, 10/06*

U.S. Cl. 526—125 **23 Claims**

1. In a process for the homopolymerization or copolymerization of propylene comprising homopolymerizing propylene or copolymerizing propylene with an alpha-olefin copolymerizable there-with in an amount of up to 30% by weight of the propylene in the presence of a catalyst which is a combination of a solid component (A) obtained by subjecting a composition (A_0) comprising as the essential ingredients titanium, magnesium and a halogen to preliminary polymerization of the propylene conducted in the presence of said composition (A_0) in a slurry containing an organoaluminum compound, and an organoaluminum compound (B), the improvement comprising:

conducting said preliminary polymerization in two steps, wherein, in the first step, propylene is polymerized in a slurry containing said composition (A_0) in a concentration adjusted to 10–100 g/lit-solvent, which is higher than the concentration of the solid component (A) when the homopolymerization or copolymerization of propylene is conducted in a slurry of the solid component (A), at a temperature of 30° C. or less so that the amount of polymer produced is 0.001 to 1 g per gram of said composition (A_0) and wherein, in the second preliminary polymerization step, polymerization of said propylene is conducted at 60° C. or greater at the same concentration of composition (A_0) as in the first step so that the amount of polymer produced in this step is 1–10 g per gram of said composition (A_0).

4,985,516

CURABLE COMPOSITION

Takeshi Sakashita; Masami Arata, both of Iwakuni, and Takashi Yamamoto, Wagi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 109,035, Oct. 16, 1987, abandoned.

Claims priority, application Japan, Oct. 30, 1986, 86-256797; Oct. 30, 1986, 86-256798; Dec. 26, 1986, 308541

This application Oct. 10, 1989, Ser. No. 418,975

Int. Cl.[5] C08F *4/52, 222/16*

U.S. Cl. 526—196 **4 Claims**

1. A curable composition consisting essentially of:

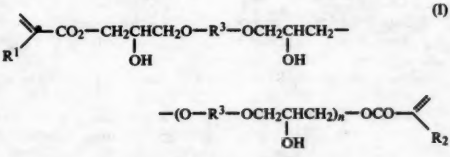
(A) a monofunctional monomer based upon (meth)acrylate, in an amount of 5 to 95% by weight;

(B) a polyfunctional monomer based on (meth)acrylate in an amount of 95 to 5% by weight and said (meth)acrylate consists of one or more monomers selected from the group consisting of

(B_1) poly(meth)acrylates of alkane polyols,

(B_2) poly(meth)acrylates of (poly)oxyalkanepolyols.

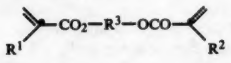
(B_3) epoxy(meth)acrylates represented by the general formula (I)



(I)

in which R_1 and R_2 represent each H or CH^3 n is zero or a positive integer and R^3 denotes a divalent aliphatic, cycloaliphatic or aromatic residue permissible or containing therein an oxygen or sulfur atom,

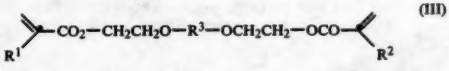
(B_4) cycloaliphatic or aromatic di(meth)acrylates represented by the general formula (II)



(II)

in which R^1 and R^2 stand each for H or CH_3 and R^3 denotes a divalent cycloaliphatic or aromatic residue having at least one cyclic group and permissible of containing therein an oxygen or sulfur atom and

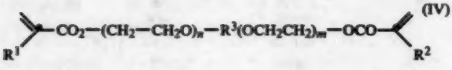
(B_5) cycloaliphatic di(meth)acrylates represented by the general formula (III)



(III)

in which R^1 and R^2 stand each for H or CH_3 and R^3 denotes a divalent cycloaliphatic residue having at least one cyclic group and permissible of containing therein an oxygen or sulfur atom,

(B_6) polyfunctional monomers based on (meth)acrylate represented by the general formula (IV)



(IV)

in which R^1 and R^2 stand each for H or CH_3, R^3 denotes a divalent aromatic residue having at least one aromatic ring and being permissible of containing therein an oxygen or sulfur atom and n and m stand each for a positive integer and

(B_7) polyfunctional monomers based on (meth)acrylate having in the molecule at least one urethane linkage

(C) an acidic group-containing monomer based on (meth)acrylate having in the molecule at least one (meth)acryloyloxyl group in an amount, on the weight basis, of from 1 to 50 parts per 100 parts of the sum of monomer (A)+(B); and

(D) a trialkylboron or its oxide in an amount, on the weight basis, of from 2 to 100 parts of the sum of monomers (A)+(B)+(C);

wherein, when cured, monofunctional layer (A) and polyfunctional monomer (B) compolymerize to produce a rigid, cross-linked, three-dimensional structure.

4,985,517

HIGH SOLIDS ACRYLIC-BASED COATINGS

Albert I. Yezrielev, Kendall Park, N.J.; Michael G. Romanelli, Brooklyn, N.Y., and William E. Wellman, Edison, N.J., assignors to Exxon Chemical Patents, Inc., Linden, N.J.

Division of Ser. No. 202,955, Jun. 6, 1988, Pat. No. 4,855,369, which is a continuation of Ser. No. 807,586, Dec. 11, 1985, abandoned. This application Jun. 2, 1989, Ser. No. 360,597

Int. Cl.[5] C08F *2/06*

U.S. Cl. 526—208 **2 Claims**

1. A polymerizable composition suitable for application after polymerization to a surface by electrostatic spraying as a high solids coating which comprises:

(a) from about 30 to 95 wt % of a monomer mixture comprising:

(i) from about 5 to 40 wt % of at least one member selected from the group consisting of hydroxy-substituted alkyl (meth)acrylates, acrylic acid and methacrylic acid;

(ii) from about 20 to 80 wt % of at least one member selected from the group consisting of non-hydroxy substituted alkyl (meth)acrylates and vinyl aromatic hydrocarbons;

(iii) from about 0.5 to 6 wt % of at least one free radical polymerization initiator;

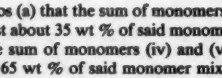
(iv) from about 1 to 55 wt % of at least one alpha-olefin selected from the group consisting of internal aliphatic olefins of from 7 to 20 carbon atoms in an amount of from said monomer mixture; and

(v) from about 0 to 64 wt % of at least one alkyl ester of acrylic acid,

with the provisos (a) that the sum of monomers (i) and (ii) comprise at least about 35 wt % of said monomer mixture, and (b) that the sum of monomers (iv) and (v) comprise less than about 65 wt % of said monomer mixture.

(b) from about 5 to 70 wt % of a polymerization solvent comprising:

(i) at least one normally liquid ester selected from the group consisting of compounds having the formula:



wherein R^1 is a straight or branched chain alkyl of 1 to 6 carbon atoms, and R'' is a straight or branched chain alkyl of 8 to 13 carbon atoms, with the proviso that R^1 and R'' together contain from 9 to 17 carbon atoms.

4,985,518

PROCESS FOR PREPARING WATER-ABSORBING RESINS

William Alexander, Naperville; Mark Anderson, Wheaton, and Barbara R. Regan, Glenview, all of Ill., assignors to American Colloid Company, Arlington Heights, Ill.

Continuation of Ser. No. 85,974, Aug. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 730,638, May 6, 1985, Pat. No. 4,654,393, which is a continuation of Ser. No. 436,428, Oct. 25, 1982, Pat. No. 4,612,250, which is a continuation-in-part of Ser. No. 710,702, Mar. 11, 1985, Pat. No. 4,612,250, which is a continuation of Ser. No. 460,037, Jan. 21, 1983, Pat. No. 4,525,527, which is a continuation-in-part of Ser. No. 748,528, Jun. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 748,246, Jul. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 854,000, Mar. 21, 1986, Pat. No. 4,677,174, which is a continuation-in-part of Ser. No. 872,654, Jun. 10, 1986, Pat. No. 4,755,562. This application Aug. 4, 1989, Ser. No. 389,616

Int. Cl.[5] C08F *30/04*

U.S. Cl. 526—240 **29 Claims**

1. A method of preparing a solid water absorbing resin comprising mixing a monomer solution of (A) acrylic acid neutralized 70–100 mole percent; and (B) a water-miscible to water-soluble polyvinyl monomer in a combined concentration of at least 30wt. %; with water to form a mixed monomer solution and initiating polymerization of monomers (A) and (B) by combining a thermal initiator and a redox initiator with the mixed monomer solution such that during polymerization, the exothermic heat of reaction is substantially the only heat energy used to accomplish polymerization, cross-linking and to drive off sufficient water to obtain a solid cross-linked resin having a water content of 15 percent by weight or less.

4,985,519

FLUORINE-CONTAINING COPOLYMER USEFUL AS PAINT VEHICLE

Toshio Koishi, Sakado; Mikio Ootani, Kawagoe; Seichi Katsuragawa, Tokorozawa, and Hideaki Sueta, Saitama, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Sep. 12, 1989, Ser. No. 406,093

Claims priority, application Japan, Sep. 13, 1988, 63-229352; Oct. 17, 1988, 63-261248

Int. Cl.[5] C08F *214/18*

U.S. Cl. 526—249 **13 Claims**

1. A copolymer comprising:

25 to 75 mol % of a fluoroolefin;

10 to 70 mol % of a combination of a fatty acid vinyl ester having not more than 4 carbon atoms in the residue of the fatty acid and at least one other carboxylic acid vinyl ester which has a larger number of carbon atoms than said fatty acid vinyl ester and is selected from the group consisting of aliphatic carboxylic acid vinyl esters having at least 4 carbon atoms in the residue of the carboxylic acid and aromatic carboxylic acid vinyl esters;

3 to 40 mol % of a hydroxyl-containing allyl ether; and

0 to 20 mol % of a carboxyl-containing monomer;

the copolymer having a number average molecular weight in the range from 3000 to 10000.

4,985,520

FLUOROELASTOMER HAVING EXCELLENT PROCESSABILITY

Kenichi Hayashi, and Yoshito Matsuoka, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 20, 1989, Ser. No. 382,395

Claims priority, application Japan, Jul. 29, 1988, 63-188205

Int. Cl.[5] C08F *14/18*

U.S. Cl. 526—254 **5 Claims**

1. A fluoroelastomer comprising vinylidene fluoride units,

hexafluoropropylene units and 35 to 0% by weight, based on the weight of the fluoroelastomer, of tetrafluoroethylene units, the total of said vinylidene fluoride units and said hexafluoropropylene units being 65 to 100% by weight based on the weight of the fluoroelastomer, the weight ratio of said vinylidene fluoride units to said hexafluoropropylene units being in the range of 80:20 to 40:60, wherein:

(a) the limiting viscosity number (ml/g) of the fluoroelastomer is in the range of from 60 to 100,

(b) the ratio of the weight average molecular weight ($\overline{Mw}$) of the fluoroelastomer to the number average molecular weight ($\overline{M}$) of the fluoroelastomer is in the range of from 2 to 4, and

(c) the limiting viscosity number of the fluoroelastomer and the ratio of H_5 to H_{20} of the fluoroelastomer, wherein H5 and H20 respectively represent the heights at molecular weights of 50,000 and 200,000 of the molecular weight distribution curve obtained by gel permeation chromatography, satisfy a requirement such that a point defined by the limiting viscosity number and the H_5/H_{20} ratio in the rectangular coordinates where the limiting viscosity number is an abscissa and the H_5/H_{20} ratio is an ordinate, is within the region defined by the quadrilateral formed by successively connecting points A(60, 1.0), B(60, 0.35), C(100, 0.2) and D(100, 0.55) in the coordinates.

4,985,521

POLYMERIZABLE DERIVATIVES OF 5-OXO-PYRROLIDINECARBOXYLIC ACID

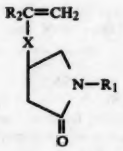
Robert B. Login, Oakland; John J. Merianos, Middletown; Gary Dandreaux, Bloomfield, and Jenn S. Shih, Paramus, all of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Division of Ser. No. 266,183, Nov. 3, 1988, Pat. No. 4,946,967. This application Jan. 17, 1990, Ser. No. 466,546

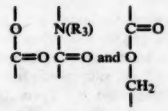
Int. Cl.[5] C08F *26/08*

U.S. Cl. 526—264 **8 Claims**

1. A copolymer of a monomer having the formula



wherein R_2 is H or CH_3, R_1 is H or a hydrocarbon radical having from 1 to 20 carbon atoms, X is selected from the group of



having the exact orientation shown and where R_3 is hydrogen or methyl and a comonomer selected from the group consisting of a comonomer having olefinic unsaturation, a quaternary ammonium comonomer and a sulfonate comonomer and mixtures thereof, and the weight ratio of monomer to comonomer is between about 20:1 and about 1:20.

4,985,522

POLYMERS CONTAINING PENDANT UREA GROUPS

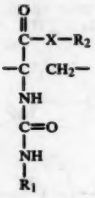
Lon J. Mathias, and David W. Kurz, both of Hattiesburg, Miss., assignors to The University of Southern Mississippi, Hattiesburg, Miss.

Division of Ser. No. 67,883, Jun. 30, 1987, Pat. No. 4,906,767. This application Dec. 19, 1989, Ser. No. 452,362

Int. Cl.[5] C08F *128/00, 126/00*

U.S. Cl. 526—288 **8 Claims**

1. A polymer containing repeat units of the formula



wherein R_1 is selected from the group consisting of C_1–C_{20} alkyls, C_1–C_{20} aralkylsulfonyls, arylsulfonyls, unsubstituted aryls, and aryle substituted with methyl and nitro, R_2 is selected from the group consisting of C_1–C_{20} alkyls, X is O, NH, or NR_3, and R_3 is selected from the group consisting of short chain alkyls.

4,985,523

ANAEROBICALLY CURING ADHESIVE SEALING COMPOSITION

Shuji Mochizuki; Atsushi Okuma, and Katsunori Haruna, all of Tokyo, Japan, assignors to Three Bond Co., Ltd., Hachioji, Japan

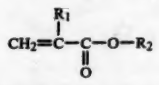
Division of Ser. No. 171,811, Mar. 22, 1988, abandoned. This application Aug. 28, 1989, Ser. No. 399,083

Claims priority, application Japan, Mar. 24, 1987, 62-69782; Jan. 18, 1988, 63-8144

Int. Cl.[5] C08F *26/02, 226/02*

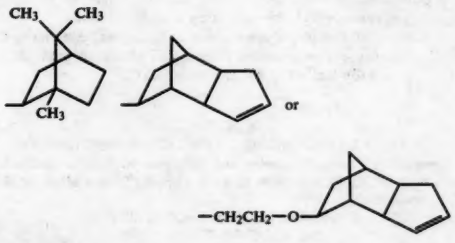
U.S. Cl. 526—301 **2 Claims**

1. An anaerobically curing adhesive sealing composition comprising (A) a mono(meth)acrylate monomer represented by formula (I)



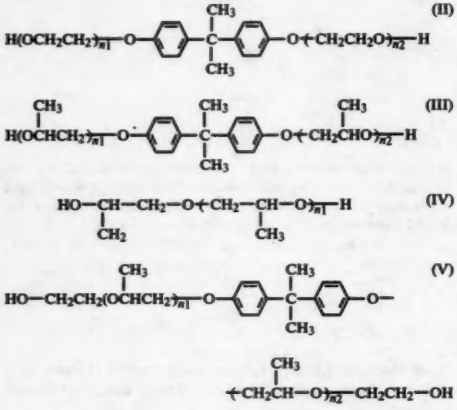
(I)

wherein R_1 represents a hydrogen atom or a methyl group; and R_2 represents



(B) a (meth)acrylate prepolymer having a urethane structure in the main chain thereof and having an average molecular weight of at least 10,000 and (C) a (meth)acrylate prepolymer having a urethane structure in the main chain thereof and an

average molecular weight of from 500 to 5,000, said methacrylate prepolymer (B) being the reaction product of an isocyanate terminated polyurethane prepolymer, prepared from a polyether polyol and an organic diisocyanate, with a (meth)acrylate of a polyhydric alcohol having active hydrogen which is a mono(meth)acrylate of a dihydric alcohol or a (mono)methacrylate or di(meth)acrylate of a trihydric alcohol and said (meth)acrylate prepolymer (C) being a polyester diol or a polyester polyol-diisocyanate reaction product having isocyanate terminal groups reacted with a (meth)acrylate of a polyhydric alcohol as defined above, and wherein the polyether polyol employed to prepare component (B) is at least one compound of the formula (II), (III), (IV) or (V);



wherein n_1 and n_2 each represents an integer of from 1 to 5.

4,985,524

PROCESS OF POLYMERIZING VINYL CHLORIDE WITH POST-HEATING OF CHARGING PASSAGE

Tadashi Amano, and Shigehiro Hoshida, both of Hazaki, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 18, 1989, Ser. No. 353,766

Claims priority, application Japan, May 19, 1988, 63-123278; Jun. 3, 1988, 63-137020

Int. Cl.[5] C08F 2/20

U.S. Cl. 526—344.2 5 Claims

1. A process of preparing a vinyl chloride polymer in a polymerization vessel comprising the steps of:

charging a polymerization initiator through a charging passage communicating with the inside of the polymerization vessel, and

polymerizing vinyl chloride or a vinyl monomer mixture containing vinyl chloride in an aqueous medium,

wherein after said polymerization initiator has been charged into the polymerization vessel, said charging passage is externally heated at not less than 80° C.

4,985,525

CLEAR ORGANOSILOXANE COMPOSITIONS

Joseph N. Clark, Mapleton, and Schuyler B. Smith, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

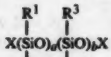
Filed Mar. 13, 1989, Ser. No. 322,014

Int. Cl.[5] C08G 77/12, 77/16

U.S. Cl. 528—15 3 Claims

1. In an improved organosiloxane composition curable by a platinum-catalyzed hydrosilation reaction and exhibiting cohesive bonding to substrates formed from organic polymers, said composition comprising

(1) a first polydiorganosiloxane gum represented by the general formula



where R^1, R^2 and R^3 are free of aliphatic unsaturation and individually represent monovalent hydrocarbon radicals or halogenated monovalent hydrocarbon radicals, R^4 represents an monovalent ethylenically unsaturated hydrocarbon radical, X represents R^1 or R^4, with the proviso that X represents a monovalent ethylenically unsaturated hydrocarbon radical when b is 0, the value of a is at least 500, the sum of a and b is equivalent to a Williams Plasticity Number of from 50 to about 200, and the value of b/a+b is from 0 to 0.04;

(2) an organohydrogensiloxane containing at least two silicon-bonded hydrogen atoms per molecule; and

(3) a platinum-containing hydrosilation catalyst,

the improvement comprising the presence in said composition of

(4) a second polydiorganosiloxane gum containing a concentration of silanol groups sufficient to impart to the mixture of said first and second gums an activity number of at least 40, where said activity number is a function of the increase in viscosity with respect to time of a solubilized curable composition consisting essentially of said mixture, a stoichiometric excess of ethyl orthosilicate, a curing catalyst and a solvent, said activity number is calculated using the formula

$$(600{,}000)\ (\text{Log } T_{e1}/T_{e2})/T,$$

T_{e1} and T_{e2} each represent the time interval, in seconds, required for elution of said solubilized composition from a capillary type viscometer at 25° C., T_{e1} begins ten minutes following formation of said solubilized composition, T_{e2} begins 20 minutes following formation of said solubilized composition and T represents the difference, in minutes, between (a) the time interval between formation of said solubilized composition and the end of time interval T_{e2} and (b) the time interval between formation of said solubilized composition the end of time interval T_{e1}.

4,985,526

CURABLE SILICONE COMPOSITION

Hirofumi Kishita, Annaka; Kouichi Yamaguchi, Takasaki, and Toshio Takago, Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 243,628, Sep. 13, 1988, abandoned. This application May 3, 1990, Ser. No. 518,220

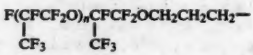
Claims priority, application Japan, Sep. 14, 1987, 62-230750

Int. Cl.[5] C08G 77/06

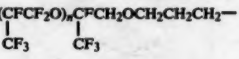
U.S. Cl. 528—15 7 Claims

1. A curable silicone composition, comprising:

(a) an organopolysiloxane having in its molecule at least two silicon-bonded C_2 to C_8 alkenyl groups and containing in its molecule at least one substituent selected from the group consisting of silicon-bonded fluorine-containing substituents represented by Formulas (1) to (4) in an amount of 3 mole % or more of all of the silicon-bonded organic groups in the molecule:

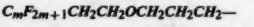


where n is an integer of 1 to 5,



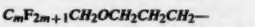
(2)

where n is an integer of 1 to 5,



(3)

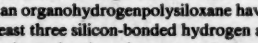
where m is an integer of 3 to 10, and



(4)

where m is an integer of 3 to 10;

(b) an organohydrogenpolysiloxane having in its molecule at least three silicon-bonded hydrogen atoms and containing in its molecule at least one substituent selected from the group consisting of silicon-bonded fluorine-containing substituents represented by said Formulas (1) to (4) and Formula (14):



(14)

where R^5 represents a C_1 to C_8 perfluoroalkyl group in an amount of 3 mole % or more of all of the silicon-bonded organic groups in the molecule; and

(c) a catalyst for promoting the addition reaction between said silicon-bonded alkenyl groups and said silicon-bonded hydrogen atoms; the proportion of said silicon-bonded hydrogen atoms in Component (b) to said silicon-bonded alkenyl groups in Component (a) being at least 0.5.

4,985,527

PREPARATION OF THERMALLY STABLE COPOLYIMIDOAMIDES CONTAINING DIORGANOPOLYSILOXANE RECURRING UNITS

Philippe Michaud, Villeurbanne, and Christian Prud'Homme, Lyons, both of France, assignors to Rhone-Poulenc Chimie, Coubevoie, France

Filed Sep. 19, 1989, Ser. No. 409,398

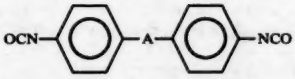
Claims priority, application France, Sep. 19, 1988, 88 12416

Int. Cl.[5] C08G 77/00

U.S. Cl. 528—26 **17 Claims**

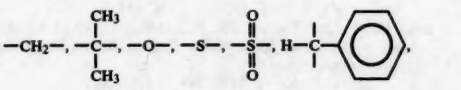
1. A process for the preparation of copolyimidoamide comprising recurring diorganopolysiloxane structural units, which comprises directly reacting the following reactants (i), (ii) and (iii), at a temperature ranging from 50° C. to 210° C. and in the presence of at least one organic solvent:

(i) a diisocyanate of thee formula:

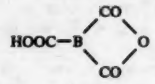


(I)

in which A is a single valence bond or one of the groups:

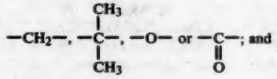


(ii) a monoanhydride of a tricarboxylic acid of the formula:

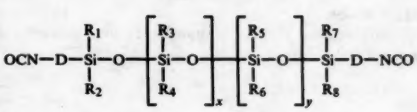


(II)

in which B is a trivalent aromatic radical or a substituted such radical, or two such radicals bonded together by a single valance bond or via one of the groups:

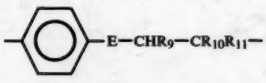


(iii) a diisocyanate comprising recurring diorganopolysiloxane structural units and having the formula:



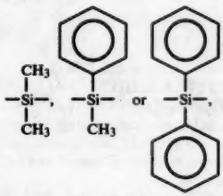
(III)

in which D is a divalent radical of the formula:

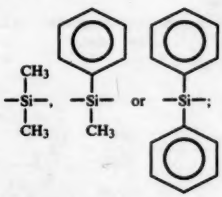


(IV)

the benzene ring of which is bonded to the isocyanate functional group NCO; E is a single valence bond, a diorganosilyl radical of the formula:



or a divalent alkylene radical containing from 1 to 6 carbon atoms bonded to the benzene ring by a single valence bond, or via an oxygen atom, a sulfur atom, an ester functional group or an amide functional group, and to the CHR_9-$CR_{10}R_{11}$ group by a single valence bond or via a diorganosilyl radical of the formula:



each of R_9, R_{10} and R_{11}, Which may be identical or different, is a hydrogen atom or a linear or branched chain alkyl radical containing from 1 to 6 carbon atoms; each of R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8, which may be identical or

different, is a linear or branched chain alkyl radical containing from 1 to 12 carbon atoms, or a substituted such radical bearing one or more chlorine, bromine or fluorine atom substituents or —CN groups, or a phenyl radical or phenyl radical substituted by one or more alkyl and/or alkoxy radicals containing from 1 to 4 carbon atoms or by one or more chlorine atoms; and x and Y are numbers, which may be identical or different, whole or fractional, the sum of which ranges from 0 to 100.

4,985,528

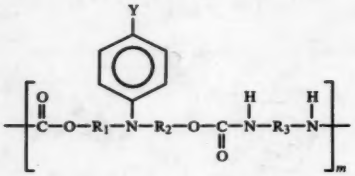
NOVEL NONLINEARLY OPTICALLY ACTIVE POLYURETHANES

Gerard Mignani; Pascal Barthelemy, and Remi Meyrueix, all of Lyon, France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Sep. 18, 1989, Ser. No. 408,383
Claims priority, application France, Sep. 16, 1988, 88 120
Int. Cl.[5] C08G 18/67
U.S. Cl. 528—59 **15 Claims**

1. A polyurethane polymer comprising recurring structural units of the formula:

(I)



in which m is a number greater than 5; R_1 and R_2, which may be identical or different, are each a saturated or unsaturated alkyl or aromatic radical; R_3 is a linear aliphatic, or cyclic aromatic or arylaliphatic hydrocarbon radical; and Y is a group which comprises a radical containing dislocated π electrons and an electron acceptor group (A).

4,985,529

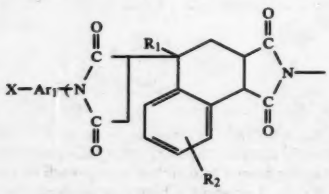
THERMOSETTABLE IMIDE COMPOUND AND EPOXY RESIN COMPOSITION CONTAINING THE SAME

Yasuhisa Saito, Higashiosaka; Shuichi Kanagawa, Osaka; Katsuya Watanabe, Takatsuki, and Kumimasa Kamio, Suita, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

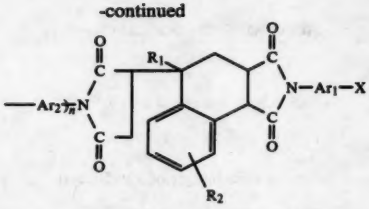
Division of Ser. No. 146,684, Jan. 21, 1988, Pat. No. 4,871,832, which is a continuation-in-part of Ser. No. 890,652, Jul. 30, 1986, abandoned. This application Apr. 26, 1989, Ser. No. 343,252
Claims priority, application Japan, Jul. 31, 1985, 60-170052; Mar. 12, 1986, 61-53922
The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.
Int. Cl.[5] C08G 59/44
U.S. Cl. 528—96 **6 Claims**

1. An epoxy resin composition containing an epoxy resin (A) and a functional group-terminated imide compound (B) represented by the general formula (II)

(II)



-continued



wherein X represents a hydroxyl or amino group, Ar_1 and Ar_2 independently represent an aromatic residue, R_1 represents a hydrogen atom or a C_1–C_{10} alkyl group, R_2 represents a hydrogen atom, a C_1–C_{20} alkyl or alkoxyl group or a hydroxyl group, and n represents a number of from 0 to 6, as essential components.

4,985,530

THERMOSETTING EPOXY RESIN COMPOSITION

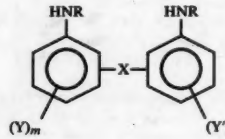
Shinkichi Murakami; Osamu Watanabe, both of Saitama; Sadahisa Wada, Kamifukuoka, and Hiroshi Inoue, Saitama, all of Japan, assignors to Tonen Corporation, Japan

Filed Jul. 27, 1989, Ser. No. 385,699
Int. Cl.[5] C08G 59/24, 59/50
U.S. Cl. 528—103 **11 Claims**

1. A thermosetting resin composition comprising:

a Bisphenol A derived epoxy resin having a number average molecular weight smaller than 650 but not smaller than 450 and a ratio of the weight average molecular weight thereof to the number average molecular weight thereof in the range of 1.3–3.0; and

at least one epoxy resin curing agent capable of cross-linking the epoxy resin and having the following formula:



wherein X is $—CR_1R_2—$, —CO—, —COO—, $—SO_2—$, —SO—, —S—, —O—, $—NR_1—$, $—SiR_1R_2—$ or $—POR_1—$ wherein R_1 and R_2 each stands for hydrogen, a lower alkyl or a phenyl; Y and Y′ each stands for hydrogen, a lower alkyl or an electron attractive group; R is a lower alkyl; and m and n each is an integer of 1–4.

4,985,531

BIREFRINGENT TRANSPARENT FILM AND PROCESS FOR PRODUCING THE SAME

Sadao Fujii; Junji Takase, and Hideki Kawai, all of Hyogo, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 341,987
Claims priority, application Japan, Apr. 22, 1988, 63-101107
Int. Cl.[5] C08G 8/02; C08B 75/00
U.S. Cl. 528—171 **11 Claims**

1. A transparent film having birefringence comprising an asymmetrically stretched amorphous aromatic polymer having a difference in refractive indices of from 0.0001 to 0.2 between two directions at right angles to each other in the same plane as the principal component.

4,985,532

THERMOTROPIC POLYESTERS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE FOR THE PRODUCTION OF MOLDINGS, FILAMENTS AND FILMS

Ralf Pakull; Dieter Freitag; Volker Eckhardt; Karsten-Josef Idel, all of Krefeld, and Uwe Westeppe, Mettmann, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

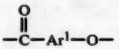
Filed Dec. 11, 1989, Ser. No. 448,351

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843559; Apr. 24, 1989, 3913403

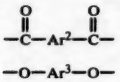
Int. Cl.[5] C08G *63/02, 63/00*

U.S. Cl. 528—190 5 Claims

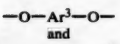
1. Thermotropic aromatic polyester containing recurring units corresponding to the following formulae



(I)

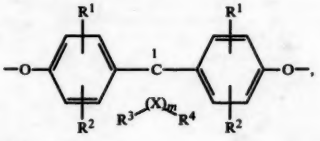


(II)



(III)

and



(IV)

in which

Ar^1, Ar^2 and Ar^3 represent difunctional aromatic radicals containing 6 to 18 carbon atoms, these radicals optionally being substituted by 1 to 4 alkyl groups, 1 to 4 C_{1-4} alkoxy groups, by 1 to 4 halogen atoms and

R^1 and R^2 independently of one another represent hydrogen, halogen, C_{1-8} alkyl, C_{5-6} cycloalkyl, C_{6-10} aryl or C_{7-12} aralkyl,

m is an integer of 4 to 7,

R^3 and R^4 represent individually selected for each X and, independently of one another, represent hydrogen or C_1–C_6 alkyl and

X represents carbon, with the proviso that at least one ring carbon atom is substituted simultaneously by two C_{1-6} alkyl radicals, the molar ratio of the recurring units (I):(II) being 20 to 85:80 to 15, the molar ratio (II):(III) and (IV) being 1 to 0.95:1 to 1.05 and the molar ratio (III):(IV) being 20 to 98:80 to 2.

4,985,533

TERMOTROPIC LIQUID-CRYSTALLINE AROMATIC POLYESTER FROM HYDROQUINONE/SUBSTITUTED HYDROQUINONE MIXTURE

Alfredo Coassolo; L. Lawrence Chapoy; Marco Foà, all of Novara, and Giampiero Sabarino, Vercelli, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 254,187, Oct. 6, 1988, abandoned. This application May 30, 1989, Ser. No. 358,512

Claims priority, application Italy, Oct. 9, 1987, 22198A/87

Int. Cl.[5] C08G *63/02*

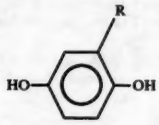
U.S. Cl. 528—193 18 Claims

1. Thermotropic liquid-crystalline aromatic polyester comprising:

(a) at least one unit derived from a dicarboxylic aromatic acid;

(b) units derived from a mixture comprising (1-phenyl-ethyl)-hydroquinone and di(phenyl-ethyl)-hydroquinone; and

(c) at least one unit derived from a hydroquinone having the general formula:



(I)

wherein

(R represents a hydrogen or a halogen atom, or an alkyl radical containing from 1 to 6 carbon atoms, or a cycloalkyl, single-ring, double-ring or fused ring, optionally substituted, aryl radical containing from 6 to 15 carbon atoms.

4,985,534

POLYETHERAMIDE HOTMELT-ADHESIVES

Hans-Detlef Heinz, Krefeld; Eduard Hänsel, Wuppertal-Elberfeld; Rolf-Volker Meyer, Krefeld, and Günter Arend, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 2, 1990, Ser. No. 474,480

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1989, 3904155; Mar. 21, 1989, 3909215

Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—272 14 Claims

1. Polyetheramide hotmelt adhesives having acid values in the range from 4 to 20, relative viscosities (1% by weight solutions in m-cresol at 25° C.) in the range from 1.3 to 2.5, softening points in the range from 100° to 200° C. and melt viscosities in the range from 100° to 190° C. at 200° C. wherein the polyetheramide hot melt adhesives are prepared from the reaction of

(1) 40 to 75% by weight of polyamide-forming components comprising caprolactam, ϵ-amino-caproic acid or a mixture thereof,

(2) 25 to 60% per weight of a mixture of components (a) to (c) in the stated equivalent ratios of

(a) 0.95 to 1.05 equivalents comprising one or more compounds selected from the group of aliphatic and aromatic C_4–C_{34} dicarboxylic acids,

(b) 0.2 to 0.9 equivalents comprising one or more compounds selected from the group of aliphatic and cycloaliphatic C_6–C_{25}-diamines

(c) 0.1 to 0.8 equivalents of one or more polyoxyalkylene diols having molecular weights (Mn) in the range from 200 to 1000 g mol^{-1}, wherein the terminal groups are OH groups, terminal primary amine groups or a mixture thereof,

where the sum of equivalents (b+c)=1, and

(3) 0 to 15% by weight of a lactam and aminocarboxylic acids different from caprolactam and aminocaproic acid

wherein chain terminators corresponding to general formula (1)

(I)

in which

R is an optionally branched, saturated or unsaturated, optionally substituted alkyl radical having a length of 12 to 40 C atoms, and

Y is one of the groups

(II)

(III)

are present in the reaction mixture during the synthesis in quantities of 0.1 to 4.0 mol-% in addition to the amount of the other polyamide-forming components.

4,985,535
MOISTURE-CURABLE HOT-MELT ADHESIVE COMPOSITION

Masaharu Takada, Osaka, and Masaru Sugimori, Takatsuki, both of Japan, assignors to Sunstar Engineering Inc., Osaka, Japan

Filed Nov. 14, 1989, Ser. No. 435,723
Claims priority, application Japan, Nov. 18, 1988, 63-292208
Int. Cl.[5] C08G 63/02
U.S. Cl. 528—272 **18 Claims**

1. A moisture-curable hot-melt adhesive composition comprising a reaction product obtainable by reacting:

(A) a mixture of:

(a) a high molecular weight thermoplastic polyester component having a weight average molecular weight of 8,000 to 25,000 and predominantly composed of a hydroxy-terminated high molecular weight polyester which contains a hydrocarbon chain with a weight average molecular weight of 600 to 6,000 and

a low molecular weight polyol having a weight average molecular weight of not more than 5,000, with

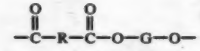
(B) a polyisocyanate compound in an NCO/OH ratio of 1.4 through 3.

4,985,536
COPOLYETHERESTER ELASTOMER WITH CYCLOALIPHATIC HARD SEGMENTS

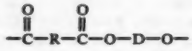
Garret D. Figuly, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 7, 1990, Ser. No. 539,109
Int. Cl.[5] C08G 63/02
U.S. Cl. 528—272 **9 Claims**

1. An improved thermoplastic, segmented, linear copolyetherester elastomer which consists essentially of a multiplicity of recurring long-chain units and short-chain ether-ester units connected head-to-tail through ester linkages, the long-chain units amounting to at least 50 percent by weight of the elastomer and being represented by the structural formula


(I)

short-chain ester units amounting to 10 to 50 percent by weight of the elastomer and being represented by the structural formula


(II)

in which

R is a divalent radical which remains after removal of carboxyl groups from a dicarboxylic acid,

G is a divalent radical which remains after removal of hydroxyl groups from a poly(alkylene oxide) glycol having a carbon-to-oxygen ratio in the range of 2.0 to 4.3 and a molecular weight in the range of 1,000 to 5,000, and

D is a divalent radical remaining after removal of terminal hydroxyl groups from a diol, wherein the improvement comprises

the R and D radicals being the same or different,

R and D each being a divalent cycloaliphatic radical having a structural formula selected from the group consisting of

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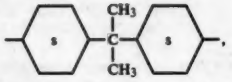


R and D each being at least 40% trans isomer and either the R or D radical being at least 70% trans isomer.

4,985,537
PROCESS OF MAKING A BIAXIALLY STRETCHED POLYESTER FILM AND BIAXIALLY STRETCHED POLYESTER FILM

Shigeo Utsumi, Yokohama; Tomoyuki Kotani, Machida, and Kichinojo Tomitaka, Yokohama, all of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

Filed Apr. 13, 1989, Ser. No. 337,842
Claims priority, application Japan, Apr. 19, 1988, 63-96145
Int. Cl.[5] B29C 55/12; C08G 63/02
U.S. Cl. 528—272 **2 Claims**

1. A biaxially stretched polyester film for a solvent development-type photo resist film by treatment with methylene chloride, which simultaneously satisfies the following equations (1) to (4):

$$, [0.155]0.160 \leqq \Delta P \leqq 0.180 \quad (1)$$

$$, 1.6050 \leqq \bar{n} \leqq 1.60085 \quad (2)$$

$$, \bar{n} \geqq 1.622 - (0.1 \times \Delta P) \quad (3)$$

$$, {}^{\alpha}MD + TD \leqq 2.0\ [3.0] \quad (4)$$

wherein ΔP, $\bar{n}$ and $\alpha MD+TD$ respectively represent the degree of surface orientation, the average refractive index and the sum (%) of the shrinkage in the machine and transverse directions after said film is subjected to heat treatment at 105° C. for 30 minutes.

2. A process for producing a biaxially stretched polyester film for a solvent development-type photo resist film by treatment with methylene chloride simultaneously satisfying the following equations (1) to (4):

$$[0.155]0.160 \leqq \Delta P \leqq 0.180 \quad (1)$$

$$1.6050 \leqq \bar{n} \leqq 1.6085 \quad (2)$$

$$\bar{n} \geqq 1.622 - (0.1 \times \Delta P) \quad (3)$$

$$\alpha MD \times TD \leqq 2.0[3.0] \quad (4)$$

wherein ΔP, $\bar{n}$ and ${}^{\alpha}MD+TD$ respectively represent the degree of surface orientation, the average refractive index and the sum (%) of the shrinkage in the machine and transverse directions after said film is subjected to heat treatment at 105° C. for 30 minutes,

which comprises the steps of extruding a polyester into a sheet form having an initial area at 280° to 320° C. and cooling said sheet to a temperature of 70° C. or lower to form a substantially amorphous sheet; stretching said amorphous sheet 10 to 25 times the initial area at 75° to 130° C. in the machine and transverse directions; heat-treating the stretched film at a temperature of 230° to 250° C. for 1 to 60 sec; and relaxing to an extent of 3 to 10% in the transverse direction during said heat treatment at 230° to 250° C. or during a cooling step at 150° C. to 230° C. after said heat treatment and relaxing to an extent of 0 to 10% at 60° to 220° C. in the machine direction.

4,985,538

SHRINKABLE POLYESTER FILM

Yujiro Fukuda, Machida, and Shigeo Utsumi, Yokohama, both of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,623
Claims priority, application Japan, Nov. 12, 1986, 61-269251; Dec. 11, 1986, 61-295590; Dec. 15, 1986, 61-298427; Feb. 17, 1987, 62-33731; Mar. 11, 1987, 62-56236; Jun. 11, 1987, 62-145753; Oct. 26, 1987, 62-269765
Int. Cl.[5] C08G *63/183*
U.S. Cl. 528—305 13 Claims

1. A shrinkable monoaxially stretched polyester film which consists essentially of a crystalline polyester and has a birefringence of 0.040 to 0.150, shrinkage of not less than 50% in one direction of either the machine direction or the transverse direction after 5 min treatment in an air oven at 100° C., shrinkage of not more than 15% in the other direction after 5 min treatment in an air oven at 100° C., shrinkage of not less than 60% in one direction of either the machine direction or the transverse direction after 30 sec treatment in a warm water of 85° C., shrinkage of not more than 15% in the other direction after 30 sec treatment in a warm water of 85° C., and heat of fusion of not less than 2 cal/g, the crystalline polyester consisting essentially of a dicarboxylic acid component and a diol component, the dicarboxylic acid component of the crystalline polyester consisting essentially of terephthalic unit acid or terephthalic acid unit and isophthalic acid unit in the molar ratio of 50/50 to 95/5 and the diol component of the crystalline polyester consisting essentially of 50 to 97 mol % of ethylene glycol unit, 3 to 50 mol % of neopentyl glycol unit and 0 to 2 mol % of a unit selected from the group consisting of diethylene glycol unit and polyethylene glycol unit, the content of each diol unit being selected so that the sum thereof is 100 mol %.

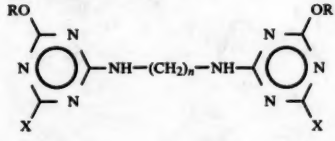
4,985,539

LIQUID-CRYSTALLINE, THERMOTROPIC POLYMER FROM DI-S-TRIAZINE AND DIAMINE

Roberto Fornasier; Massimo Tornatore, both of Novara, and Larry L. Chapoy, Lesa, all of Italy, assignors to Himont Italia s.r.l., Milan, Italy

Filed Mar. 13, 1989, Ser. No. 322,424
Claims priority, application Italy, Mar. 14, 1988, 4100 A/88
Int. Cl.[5] C08G *73/06*
U.S. Cl. 528—423 5 Claims

1. A polymer obtained by the polycondensation of at least one di-s-triazine of the formula:



(I)

wherein:

R represents a linear or branched alkyl radical containing from 1 to 5 carbon atoms,

X represents a halogen, and

n is an integer within the range of from 5 to 30, with at least one other copolymersiable monomer selected from diamines having the formula:

$$H_2N—R_1—NH_2 \quad (2)$$

wherein:

R_1 represents a divalent alkyl radical, a cycloalkyl radical, or an alkyl-aryl radical of from 1 to 20 carbon atoms.

4,985,540

PROCESS FOR REMOVING RHODIUM-CONTAINING CATALYST RESIDUE FROM HYDROGENATED NITRILE RUBBER

William G. Bradford, Sarnia; Gilles J. Arsenault, Courtright, and Alexander J. Marshall, Bright's Grove, all of Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Nov. 20, 1989, Ser. No. 438,037
Int. Cl.[5] C08F *6/08*
U.S. Cl. 528—482 11 Claims

1. A process for removing rhodium-containing catalyst residue from hydrogenated nitrile rubber, said process consisting of contacting an ion exchange resin with a hydrocarbon phase, wherein said hydrocarbon phase, contains

(i) hydrogenated nitrile rubber

(ii) rhodium-containing catalyst residue, and

(iii) hydrocarbon solvent, characterized in that said ion exchange resin is a functionalized macroreticular resin having a functional group selected from

(a) a primary amine,

(b) a secondary amine,

(c) thiol,

(d) carbodithioate

(e) thiourea, and

(f) dithiocarbamate.

4,985,541

NOVEL CYTOTOXIC PROTEIN

John M. Maraganore, Waltham, Mass., and Wayne R. Kindsvogel, Seattle, Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Filed Apr. 10, 1987, Ser. No. 36,840
Int. Cl.[5] C07K *15/10, 3/02, 3/20, 3/22*
U.S. Cl. 530—370 6 Claims

1. A purified cytotoxic protein having the following properties:

inhibits protein synthesis in vitro;

exhibits abortifacient activity in mice;

does not contain N-linked glycosidic linkages;

has an amino acid composition consisting essentially of, in moles of amino acid per mole of protein,

Asx	20	Pro	10
Glx	19	Tyr	12
Ser	18	Val	18
Gly	9	Met	5
His	1	Ile	16
Arg	15	Leu	26
Thr	15	Phe	13
Ala	26	Lys	11;

has a molecular weight as determined by polyacrylate gel electrophoresis of approximately 25,000 Daltons; and

contains the amino-terminal amino acid sequence: X-Asp-Val-Ser-Phe-Arg-Leu-Ser-Asp-Ala-Asn-Ser-Lys-Ser-Tyr-Arg-Lys-Phe-Ile-Thr-Ser-Leu-Arg-Asn-Val-Leu-Pro-Lys-Ala-Gly-Glu-Val-Phe-Asn-Ile-Pro

wherein X is tyrosine or H.

4,985,542

KIT FOR THE DETERMINATION AND DIAGNOSIS OF NON-GOODPASTURE GLOMERULONEPHRITIS

Howard Fillit; Shridhar P. Damle; John Zabriskie, and John D. Gregory, all of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Division of Ser. No. 618,500, Jun. 8, 1984, Pat. No. 4,849,339.
This application May 17, 1989, Ser. No. 352,727
The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.
Int. Cl.[5] C07K *15/14, 3/00*; A61K *39/00, 35/12*
U.S. Cl. 530—395 1 Claim

1. A kit for the diagnosis of acute or chronic human post-

streptococcal glomerulonephritis which comprises purified bovine or human anionic, solubilizable glomerular glucosamine or galactosamine containing proteoglycan antigens of about 200,000 molecular weight wherein the ratio of glucosamine:galactosamine is approximately 4.5:1 and said antigen is capable of immunologically reacting withhuman IgG and IgM antibodies in human sera in patients with poststreptococcal glomerulonephritis.

4,985,543

LECTINS AND ANTIRETROVIRAL DRUGS CONTAINING THE LECTINS AS ACTIVE INGREDIENT

Norifumi Sugita, Tokyo; Koichi Niimura, Sayama; Yoshiharu Oguchi; Kunitaka Hirose, both of Tokyo; Kenichi Matsunaga, Tokorozawa; Minoru Oohara, Tokyo; Shigeaki Muto, Tokyo; Junji Kakuchi, Tokyo; Takao Furusho, Machida; Chikao Yoshikumi, Kunitachi, and Masaaki Takahashi, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 207,836

Claims priority, application Japan, Jun. 18, 1987, 62-152092

Int. Cl.[5] C07K *3/00*; A61K *37/10*

U.S. Cl. 530—396. 5 Claims

1. A lectin obtained from a plant selected from:

(1) *Lotus tetragonolobus* and *Ulex europeus;*

(2) *Abrus precatorius, Arachis hypogaea, Bandeirea simplifolia, Banhinia purpunea, Calpuria aegggptiana, Fomes formentarius, Glycine max, Maackia amurensis, Phaseolus lunatas, Ricinus communis, Sophora japonica, Wistaria floribunda* and *Vicia cracca;* and

(3) *Canavalia ensiformis, Lens eulinaria, Pisum satiuvm, Vicia faba, Jack bean, Cytisus sessilifolius, Laburnus alpinum, Cerastrium fomentosus* and *Ulex europeus,* each of (1), (2) and (3) being in the Makela classification, said lectin having the following properties:

(a) positive results when subjected to the α-naphthol-sulfuric acid, indole-sulfuric acid, anthrone-sulfuric acid or phenol-sulfuric acid reaction and, after hydrochloric acid hydrolysis, the Lowry-Folin process or the ninhydrin reaction;

(b) elementary analysis: 20–55% carbon, 3–9% hydrogen and 0.1–16% nitrogen;

(c) a pH of 6.0–7.0;

(d) the sugar component, when present, comprises at least glucose and N-acetyl-glucosamine and the protein component comprises at least glutamic acid, aspartic acid and lysine;

(e) infrared absorption spectrum peaks at 3,600−3,200 cm^{-1};

(f) a molecular weight of $10^3-3\times10^6$ as measured by gel filtration chromatography; and

(g) soluble in water and aqueous solvent, and insoluble in chloroform, benzene and ether.

4,985,544

PROCESS FOR RENATURING FISH GROWTH HORMONE

Yoshiharu Yokoo, Kanagawa, and Seiji Sugimoto, Tokyo, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1988, Ser. No. 227,326

Claims priority, application Japan, Aug. 4, 1987, 62-194607

Int. Cl.[5] C07K *15/08, 3/18, 3/26, 3/28*

U.S. Cl. 530—399 11 Claims

1. A process for renaturing a fish growth hormone polypeptide in its natural form which consists of the successive steps of:

(1) converting a fish growth hormone polypeptide into the corresponding reduced and denatured protein by adding a denaturing agent and a reducing agent thereto to solubilize the protein;

(2) removing the reducing agent;

(3) oxidizing the protein, as denatured, to form disulfide bonds at the same sites as those observed in the corresponding natural protein; and thereafter

(4) removing the denaturing agent to thereby isolate and purify the renatured protein.

4,985,545

WATER-SOLUBLE FORMAZAN COLORANT CONTAINING REACTIVE GROUP AND METHOD OF DYEING BY ITS USE

Kiyoshi Himeno, Munakata; Toshio Hihara, Kitakyushu; Kanzi Shimizu, Kitakyushu, and Yukiharu Shimizu, Kitakyushu, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

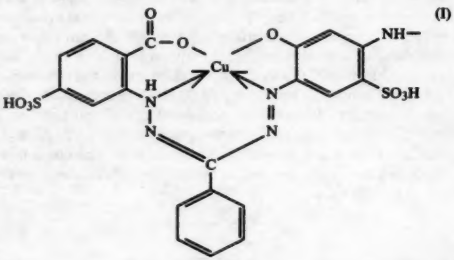
Filed Aug. 15, 1988, Ser. No. 243,310

Claims priority, application Japan, Jan. 5, 1987, 62-53; Mar. 2, 1987, 62-47344

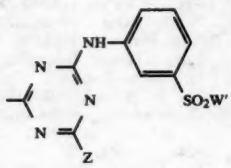
Int. Cl.[5] C09B *62/503*; D06P *1/384*

U.S. Cl. 534—618 4 Claims

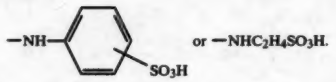
1. A water-soluble formazan colorant having the following formula (I) in the form of a free acid



(I)



wherein W' is $-CH{=}CH_2$ or $-C_2H_4OSO_3H$, and Z is



or $-NHC_2H_4SO_3H$.

4,985,546

POLYOXYLALKYLENE AMINO DIOL SUBSTITUTED COLORANTS

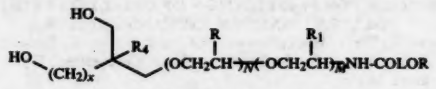
John W. Miley, Campobello, and John W. Rekers, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 135,421, Dec. 21, 1987. This application Jun. 19, 1989, Ser. No. 371,907

Int. Cl.[5] C09B *1/14, 23/00, 29/00, 56/16*

U.S. Cl. 534—729 3 Claims

1. A polymeric colorant of the formula:



wherein R and R_1 are independently selected from hydrogen or lower alkyl; R_4 is selected from hydrogen or lower alkyl; x is o or 1; N and M are each integers of from 1 to about 100 and the sum of N and M is from 3 to about 100; and the designation "COLOR" represents a chromophoric molecule.

4,985,547

EXTERNAL SKIN CARE PREPARATION

Shinji Yano; Akira Kawamata, both of Utsunomiya; Yoshihiro Minematsu; Shuichi Akazaki, both of Funabashi; Mitsuko Zama, Tokyo; Genji Imokawa; Naotake Takaishi, both of Utsunomiya; Tsuyoshi Ohtomo, Funabashi, and Takashi Komori, Tokyo, all of Japan, assignors to Kao Corporation, Tokyo, Japan

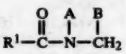
Filed Mar. 3, 1988, Ser. No. 163,835

Claims priority, application Japan, Mar. 6, 1987, 62-51276; Mar. 9, 1987, 62-53769; Mar. 11, 1987, 62-56049; Mar. 16, 1987, 62-60718; Mar. 16, 1987, 62-60719; May 28, 1987, 62-132054; Jun. 2, 1987, 62-138727; Jun. 30, 1987, 62-163682; Jun. 30, 1987, 62-163683; Jun. 30, 1987, 62-163685

Int. Cl.[5] C07C *103/10, 103/00;* A61K *7/00*

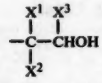
U.S. Cl. 536—4.1 **8 Claims**

1. An external skin care preparation comprising (a) a compound represented by Formula (I), or a salt thereof:



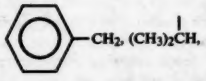
(I)

wherein R^1 means an aliphatic hydrocarbon group having 9–25 carbon atoms, A denotes a group $CH_2)_lOH$ (1: integer of 3;14 5), a group

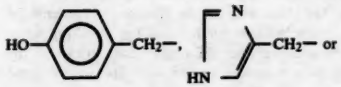


(X^1,X^2,X^3: H, C_{1-5}-alkyl or hydroxyalkyl, individually), a group $CH_2CH_2O)_mH$ (m: integer of at least 2), a group

(Y: H or alkali metal; R^2: H, —CH_3,



($(CH_3)_2CHCH_2$—, $C_2H_5(CH_3CHCH_2$—, $HOCH_2$—, $CH_3(HO)CH$—, $CH_3SCH_2CH_2$—, $YOCOCH_2$—, $YOCOCH_2CH_2$—,



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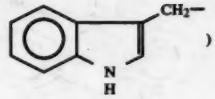
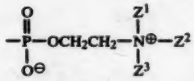
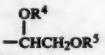


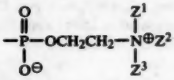
or a group —$CH_2CH_2OR^2$[R^3: sugar residuum or group



(Z^1, Z^2, Z^3: H, straight-chain or branched X_{1-6}-alkyl, or aralkyl)], and B stands for a group



[R^4: H, sugar residuum, group



(Z^1,Z^2,Z^3: the defined above) or group $CH_2CH_2O)_nH$ (n: integer of at least 1); R^5: C_{9-25}-aliphatic hydrocarbon group] or a group

R^5: as defined above), with a proviso that X^1,X^2,X^3 and R^4 do not mean H at the same time, and (b) at least one member selected from the group consisting of a surfactant, a plant oil, an animal oil, a synthetic oil, a fatty acid, a glyceride, an analgesic, an antiphlogistic, and antipruritic, a disinfectant, an astringent, an emollient, a hormone, a moisturizer, an ultraviolet absorbent, an alcohol, a chelating agent, a pH regulator, an antiseptic, a thickener, a pigment, and a perfume.

4,985,548

4-DEMETHOXY-4-AMINO-ANTHRACYCLINES

Michele Caruso; Antonino Suarato; Francesco Angelucci, and Federico Arcamone, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.R.L., Milan, Italy

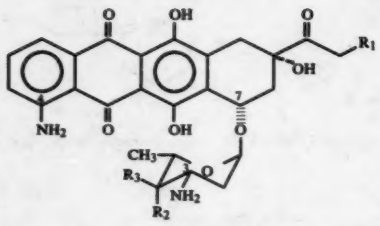
Continuation of Ser. No. 181,506, Apr. 14, 1988, abandoned. This application Jan. 9, 1990, Ser. No. 462,549

Claims priority, application United Kingdom, Apr. 21, 1987, 8709353; Feb. 12, 1988, 8803302

Int. Cl.[5] C07H *15/00, 15/24;* A61K *31/00*

U.S. Cl. 536—6.4 **8 Claims**

1. An anthracycline glycoside having the general formula (I)



I

wherein R_1 represents a hydrogen atom or a hydroxyl group, one of R_2 and R_3 represents a hydrogen atom and the other of R_2 and R_3 represents a hydrogen atom or a hydroxyl group; and pharmaceutically acceptable acid addition salts thereof.

4,985,549

PROCESS FOR PREPARING AMIKACIN

Vincenzo Giobbio, Turin, and Leonardo Ambrosini, Bergamo, both of Italy, assignors to Chementecno S.r.l., Milan and Irca Industrie Ricerche Chimiche d'Albano S.p.A., Bergamo, both of, Italy

Filed Jan. 30, 1990, Ser. No. 472,262
Claims priority, application Italy, Sep. 22, 1989, 21794 A/89
Int. Cl.[5] C07H *15/22*
U.S. Cl. 536—13.8 **9 Claims**

1. A process for preparing Amikacin (I), wherein 1-N-(L-(−)-α-benzyloxycarbonylamino-α-hydroxybutyryl)-3,6'-di-N-benzyloxycarbonyl-Kanamycin A (II) is suspended in a ratio of from 1:5 to 1:25 in a solvent selected from the group consisting of alcohols, ketones, dimethylformamide, acetonitrile, aliphatic esters, hydrocarbons, chlorinated solvents and water; after addition of a suitable catalyst selected from the group consisting of Pt/C, mixtures of Pd/C and Ni-Raney, and Pd/C in an amount equal to about the weight of compound (II), an aqueous solution of formic acid from 10% to 100% is slowly added at a temperature between 0° and 100° C. in a ratio of about 1:1 with compound (II), the reaction mixture containing product (I) and Kanamycin A being percolated through a ion exchange resin column by eluting with a 2N NH_3 solution, the fraction of compound (I) being separated and the solvent evaporated under reduced pressure.

4,985,550

POLYHYDROXYLATED AND HIGHLY FLUORINATED COMPOUNDS, THEIR PREPARATION AND THEIR USE AS SURFACTANTS

Brigitte Charpiot; Jacques Greiner; Maurice Le Blanc; Alexandre Manfredi, all of Nice; Jean Riess, Falicon, and Leila Zarif, Nice, all of France, assignors to Alliance Pharmaceutical Corp., Otisville, N.Y.

Filed Jul. 28, 1987, Ser. No. 78,626
Claims priority, application France, Jul. 29, 1986, 86 11084
Int. Cl.[5] C07H *5/02; A61K 31/70*
U.S. Cl. 536—18.4 **16 Claims**

1. Compounds having a polyhydroxylated hydrophilic moiety, a highly fluorinated moiety and a functional junction group linking said moieties together, wherein said hydrophilic moiety is derived from a sugar which is a monoholoside or diholoside, a polyol containing at least 4 hydroxyl groups, or an aminopolyol having at least 3 hydroxyl groups, and wherein said highly fluorinated moiety consists of a fluorocarbon group wherein at least 50% of the atoms bonded to the carbon skeleton are fluorine atoms, the other atoms bonded to the carbon skeleton being hydrogen, chlorine or bromine atoms, said highly fluorinated moiety containing at least 4 fluorine atoms as well as the internal ethers and ketals thereof, said compounds having a discrete molecular weight.

4,985,551

PROCESS FOR PURIFICATION OF CATALYSTS FROM POLYOLS USING ION EXCHANGE RESINS

John G. Perry, Hackettstown, N.J., and Walter A. Spelyng, Baton Rouge, La., assignors to BASF Corporation, Wyandotte, Mich.

Filed Dec. 29, 1988, Ser. No. 291,558
Int. Cl.[5] C07G *3/00*; C07H *1/00*; C08B *37/00*
U.S. Cl. 536—18.6 **6 Claims**

1. A process for the ion exchange of polyols for catalyst removal wherein said catalyst is an alkali hydroxide or alkoxide comprising the sequential steps of:

(a) mixing the polyether molecule having a molecular weight of 500–10,000 with sufficient water to form an emulsion,

(b) blending into the product of (a) a sufficient amount of a lower aliphatic alcohol to break the emulsion formed in step (a),

(c) passing the product of step (b) through a macroporous cation exchange resin to obtain a purified polyether molecule, alcohol, and water.

4,985,552

PROCESS FOR OBTAINING CHEMICALLY DEFINED AND REPRODUCIBLE POLYDEOXYRIBONUCLEOTIDES

Gianfranco Fedeli, Milan; Giuseppe Diamantini, Ap iano; Gentile; Marisa Maontovani, Villas Guardia, and Giuseppe Prino, Milan, all of Italy, assignors to Crinos Industria Farmacobiologica S.p.A., Villa Guardia, Italy

Continuation of Ser. No. 36,996, Apr. 10, 1987, abandoned. This application Jul. 5, 1989, Ser. No. 374,561
Claims priority, application Italy, Apr. 17, 1986, 20117 A/86
Int. Cl.[5] C07N *1/00*
U.S. Cl. 536—27 **37 Claims**

1. A process for producing the polydeoxyribonucleotide Defibrotide from a solution of raw nucleic acids obtained from mammalian cells, said solution being substantially free of polysaccharides and proteins, said process comprising the steps of:

(1) forming highly polymerized nicked polydeoxyribonucleotides by stabilizing an aggregation of the raw nucleic acids by adjusting the ionic strength and the pH of the solution until the maximum reversible hyperchromicity has been reached;

(2) depolymerizing the polydeoxyribonucleotides until the reversible hyperchromicity of the solution is at a value of $h=15\pm5$, measured as a percent in native DNA, by heating the resulting solution to a depolymerizing temperature for the said polydeoxyribonucleotide, and maintaining the solution at a depolymerizing temperature until said specified reversible hyperchromicity value has been achieved;

(3) terminating the depolymerization reaction by cooling, and removing the hydrogen bonds in any double filament fragment in the depolymerized solution by making the medium alkaline, thereby forming single filament polydeoxyribonucleotide fragments; and

(4) stabilizing the resulting single filament fragments of polydeoxyribonucleotides by heating the resulting solution at a temperature and pH higher than those of the depolymerization reaction to prevent hydrogen bond reformation.

4,985,553
PROCESS FOR THE OXIDATION OF DI-, TRI-, OLIGO- AND POLYSACCHARIDES INTO POLYHYDROXYCARBOXYLIC ACIDS, CATALYST USED AND PRODUCTS THUS OBTAINED

Patrick M. Fuertes, Lille, and Guy M. Fleche, Merville, both of France, assignors to Roquette Freres, Lestrem, France

Filed Jan. 28, 1987, Ser. No. 7,654
Claims priority, application France, Jan. 30, 1986, 86 01305
The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.
Int. Cl.[5] C08B *31/00, 37/00;* C13K *1/00;* C07H *1/00;* C07C *51/00*
U.S. Cl. 536—124 26 Claims

1. A process for the preparation of polyhydroxycarboxylic acids by way of the selective oxidation of polysaccharides having a reducing terminal function of the aldose type, the said process comprising:

selecting at least one polysaccharide having a reducing function of the aldose type in the form of an aqueous solution,

dispersing into the said polysaccharide solution a catalyst based on a noble metal selected from the group consisting of palladium, platinum, rhodium and osmium and fixed on an inert support, said catalyst being "doped" with at least one metal, called promoter and selected from the group consisting of those of the Groups IV, V and VI of the Periodic Table,

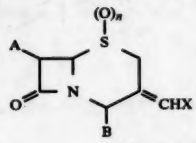
starting the reaction by supplying the polysaccharide solution, having dispersed therein the catalyst, with an oxygen containing gas and with an alkaline agent.

4,985,554
PROCESS FOR THE PREPARATION OF 3-EXOMETHYLENE CEPHAM DERIVATIVES

Jan Verweij, Leiden; Jan J. De Koning, Rijswijk, and Hendrik A. Witkamp, Pijnacker, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

PCT No. PCT/NL88/00035, § 371 Date Feb. 15, 1989, § 102(e) Date Feb. 15, 1989, PCT Pub. No. WO89/00572, PCT Pub. Date Jan. 26, 1989
PCT Filed Jul. 13, 1988, Ser. No. 337,525
Claims priority, application European Pat. Off., Jul. 13, 1987, 87201323.0
Int. Cl.[5] C07D *501/18*
U.S. Cl. 540—215 8 Claims

1. A process for the preparation of a 3-methylene or 3-halomethylene cephem compound of the formula



1

wherein,

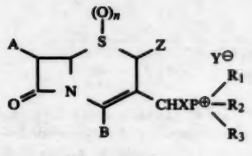
A is an amino group or a protected amino group,

B is a carboxy group or a protected carboxy group, or a non-toxic, pharmaceutically acceptable salt thereof,

X is hydrogen or halogen and

n is 0, 1 or 2,

which comprises converting a 3-phosphoniomethyl-3-cephem derivative of formula 2:



2

wherein,

A, B, X and n are each as defined above,

Y is halogen,

Z is Y or hydrogen, and

R_1, R_2 and R_3 individually are carbocyclic aryl or carbocyclic aralkyl groups,

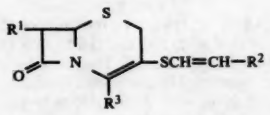
into a compound of formula 1.

4,985,555
CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Zenzaburo Tozuka, Toyonaka; Nobuyoshi Yasuda, Nishinomiya, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 931,978, Nov. 24, 1986, Pat. No. 4,871,730, which is a continuation of Ser. No. 631,898, Jul. 18, 1984, abandoned. This application Jul. 27, 1989, Ser. No. 385,542
Claims priority, application United Kingdom, Aug. 1, 1983, 8320673; Nov. 15, 1983, 8330472
Int. Cl.[5] C07D *501/04;* A61K *31/545*
U.S. Cl. 540—229 1 Claim

1. A cephem compound of the formula:



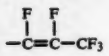
wherein R^1 is amino, R^2 is hydrogen, phenyl, pyridyl which may have a lower alkyl group, or cyano, and R^3 is carboxy or protected carboxy, or a pharmaceutically acceptable salt thereof.

4,985,556
PERFLUORO(DIALKYLAMINOPROPENE) DERIVATIVES

Takashi Abe, Kasugai, and Eiji Hayashi, Konan, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,308
Claims priority, application Japan, Sep. 10, 1987, 62-227467; Sep. 10, 1987, 62-227468; Sep. 10, 1987, 62-227469; Sep. 10, 1987, 62-227470
The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.
Int. Cl.[5] C07C *87/26;* C07D *207/00, 211/00, 241/04*
U.S. Cl. 540—484 12 Claims

1. A perfluoro(dialkylaminopropene) represented by the formula A"-B", wherein A" stands for



and B" for a perfluoro-di-substituted amino group having a total of 4 to 6 backbone carbon atoms and represented by the formula

wherein R_1 and R_2 independently stand for a perfluoroalkyl group of 1 to 5 carbon atoms and may be bonded directly to each other or indirectly through the medium of an oxygen atom or a nitrogen atom.

7. A perfluoro(dialkylaminopropene) represented by the formula A"-B", wherein A" stands for

and B" for a perfluoro-di-substituted amino group having a total of 2 to 6 backbone carbon atoms and represented by the formula

wherein R_1 and R_2 independently stand for a perfluoroalkyl group of 1 to 5 carbon atoms and may be bonded directly to each other or indirectly through the medium of an oxygen atom or a nitrogen atom.

4,985,557

OPTICALLY ACTIVE PYRIDOBENZOXAZINE DERIVATIVES AND INTERMEDIATES THEREOF

Isao Hayakawa; Shohgo Atarashi; Masazumi Imamura; Shuichi Yokohama; Nobuyuki Higashihashi; Katsuichi Sakano, and Masayuki Ohshima, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

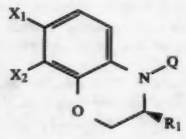
Division of Ser. No. 876,623, Jun. 20, 1986. This application Mar. 23, 1989, Ser. No. 327,653

Claims priority, application Japan, Jun. 20, 1985, 60-134712; Oct. 11, 1985, 60-226499; Jan. 28, 1986, 61-16496

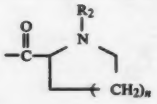
Int. Cl.[5] C07D *419/00, 498/02*

U.S. Cl. 540—598 **1 Claim**

1. An isolated 4-substituted benzoxazine derivative represented by the formula (X)



wherein X_1 and X_2, which may be the same or different, each represents a halogen atom, R_1 represents an alkyl group having 1 to 4 carbon atoms, and Q represents a group



wherein R_2 represents a substituted sulfonyl group, an alkoxycarbonyl group or an aralkyloxycarbonyl group, and n represents an integer of 1 to 3.

4,985,558

1,4-DIHYDROPYRIDINE DERIVATIVE

Kenichi Suzuki, Kounosu; Haruaki Inada, Omiya; Akira Kiue, Iwatsuki, and Tetsuro Sano, Urawa, all of Japan, assignors to Nikken Chemicals Co., Ltd., Tokyo, Japan

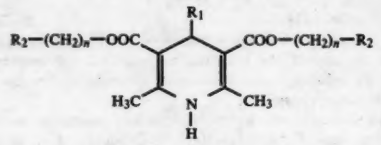
Filed Jul. 25, 1989, Ser. No. 384,796

Claims priority, application Japan, Jul. 28, 1988, 63-186711; Mar. 14, 1989, 1-59828

Int. Cl.[5] C07D *401/04*

U.S. Cl. 546—256 **6 Claims**

1. A 1,4-dihydropyridine compound of the formula



wherein R_1 is a 2-(5,6-dihydro-p-dioxinyl) group, R_2 is a pyridyl group which may be substituted with one methyl group or ethyl group, and n is an integer of 1 to 4.

4,985,559

UV ABSORBING VINYL MONOMERS

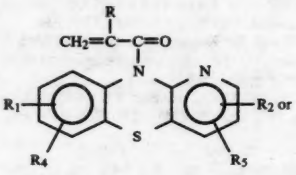
Eugene P. Goldberg, Gainesville, Fla.; Fu-Mian Li, Beijing, China, and Ching-Wang Luo, Plantation, Fla., assignors to University of Florida, Gainesville, Fla.

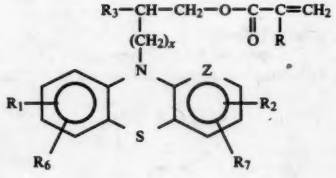
Continuation-in-part of Ser. No. 108,690, Oct. 15, 1987, abandoned. This application Sep. 1, 1988, Ser. No. 239,424

Int. Cl.[5] C07D *279/30, 279/22, 513/04*

U.S. Cl. 544—34 **8 Claims**

1. An ultraviolet light absorbing, polymerizable monomer having the structure:





wherein:

Z is N or —CH—,

R is H or CH_3,

R_1 and R_2 may be the same or different and are H, alkyl or alkyloxy having from 1 to 20 carbon atoms, alkylcarboxy having from 2 to 20 carbon atoms, arylcarboxy having from 7 to 25 carbon atoms or hydroxyl;

R_3 is H, hydroxylk, hydroxyalkyl having from 1 to 20 carbon atoms or siloxy;

R_4, R_5, R_6 and R_7 may be the same or different and is H or halogen; and

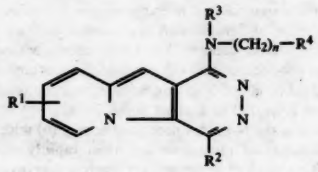
x is an integer from 1 to 20.

4,985,560
PYRIDAZINO(4,5-B)INDOLIZINES

Annmarie L. Sabb, Pennington, N.J.; Magid A. Abou-Gharbia, Glen Mills, Pa., and Gervais Dionne, St. Laurent, Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Jan. 12, 1990, Ser. No. 464,468
Int. Cl.[5] C07D 471/14; A61K 31/495, 31/535
U.S. Cl. 544—115 17 Claims

1. A compound of the formula:



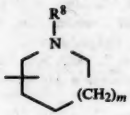
in which

R^1 is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, cyano, halo, nitro, amino, or mono- or dialkylamino in which the alkyl groups have 1 to 6 carbon atoms;

R^2 is hydrogen, alkyl of 1 to 6 carbon atoms, phenyl, benzyl, 2-thienyl, 3-thienyl, or 2-, 3- or 4-pyridinyl;

R^3 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl;

R^4 is N-methyl-pyrrol-2-yl, 2-, 3- or 4-pyridinyl, 3-quinuclidinyl or



wherein

n is 1 to 5;

m is 0 to 3; and

R^8 is hydrogen or alkyl of 1 to 6 carbon atoms; or

R^4 is

wherein

(a) n is 2, R^5 taken with R^3 is ethylene and R^6 is —CHO, alkyl of 1 to 6 carbon atoms, unsubstituted or substituted phenyl, pyrimidinyl, pyridinyl, or pyrazinyl where the substituents are alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo, cyano, nitro or trifluoromethyl;

(b) n is 1 to 5, and R^5 and R^6 taken together are polymethylene of 4 to 6 carbon atoms which may be alkyl substituted with a group having from 1 to 6 carbon atoms or R^5 and R^6 taken with the nitrogen atom to which they are attached are morpholino, 3-azabicyclo[3.2.2]nonan-3-yl, pyrrol-1-yl, pyrrolidin-2-on-1-yl, pyrrolidin-2-thion-1-yl, imidazol-1-yl, or a piperazin-1-yl moiety in the 4-position of which is hydrogen, —CHO, alkyl of 1 to 6 carbon atoms or unsubstituted or substituted phenyl, pyrimidinyl, pyridinyl, or pyrazinyl where the substituents are alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo, cyano, nitro or trifluoromethyl;

(c) n is 1 to 5, and R^5 and R^6 are, independently, hydrogen, alkyl of 1 to 6 carbon atoms, phenyl, 3-quinuclidinyl, 2-adamantyl, bicyclo[3.2.1]octan-2-yl, bicyclo[3.3.1]nonan-9-yl or 2-, 3- or 4-pyridinyl;

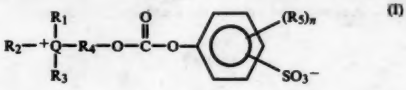
or a pharmaceutically acceptable salt thereof.

4,985,561
SULFUR TRIOXIDE SULFONATION OF AROMATIC CHLOROFORMATES

Stephen A. Madison; Leonora M. Ilardi, both of Valley Cottage, N.Y., and Hans Cerfontain, Amsterdam, Netherlands, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Aug. 29, 1989, Ser. No. 400,195
Int. Cl.[5] C07D 711/42, 711/46; C07C 143/76
U.S. Cl. 544—158 21 Claims

1. A process for preparation of sulfophenyl quaternary ammonium and phosphonium carbonate esters of the formula:



(I)

wherein:

R_1, R_2 and R_3 are each a radical selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, alkaryl, aryl, phenyl, hydroxyalkyl, and polyoxyalkylene;

or two or more of R_1, R_2 and R_3 together form an alkyl substituted or unsubstituted nitrogen-containing heterocyclic ring system;

or at least one of R_1, R_2 and R_3 is attached to R_4 to form an alkyl substituted or unsubstituted nitrogen-containing heterocyclic ring system;

R_4 is selected from a bridging group consisting of alkylene, cycloalkylene, alkylenephenylene, phenylene, arylene, and polyalkoxylene; and wherein the bridging group can be unsubstituted or substituted with C_1–C_{20} atoms selected from alkyl, alkenyl, benzyl, phenyl and aryl radicals;

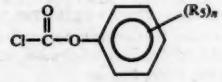
Q is nitrogen or phosphorous;

R_5 is C_1–C_{12} alkoxy, carboxy, C_1–C_{12} alkyl carboxy group and mixtures thereof; and

n ranges from 0 to 4;

comprising the steps of:

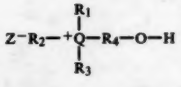
(i) reacting an aryl chloroformate of the formula:



(II)

with sulfur trioxide in a molar ratio to provide effective amounts of each reactant to form an aryl sulfonated chloroformate; and

(ii) condensing said aryl sulfonated chloroformate with a quaternized hydroxy compound to form the carbonate esters, said quaternized hydroxy compound having the formula:



(III)

wherein Z is a mono- or multi-valent anion leading to charge neutrality when combined with Q^+ in the appropriate ratio.

4,985,562

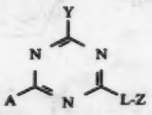
HALOMETHYL-1,3,5-TRIAZINES CONTAINING AN AMINE-CONTAINING MOIETY

Mitchell A. Rossman, Minneapolis, and James A. Bonham, Grant Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 7, 1988, Ser. No. 241,383
Int. Cl.[5] C07D 403/02; G03C 1/725
U.S. Cl. 544—209 14 Claims

1. A 1,3,5-triazine compound having a halomethyl substituent on a carbon atom of the triazine nucleus and an amine-containing moiety linked to another carbon atom of the triazine nucleus, said amine-containing moiety containing at least one tertiary amine group having at least one alkyl substituent on the amine nitrogen atom, said at least one alkyl substituent having a hydrogen atom on the carbon atom adjacent to the amine nitrogen atom, provided that the amine nitrogen atom is not directly attached to the 1,3,5-triazine nucleus by a covalent bond or by a conjugated linkage.

5. A compound having the formula:



wherein

A represents a member selected from the group consisting of mono-, di- and trihalomethyl groups,

Y represents a member selected from the group consisting of A, L-Z, NH_2, NHR, NR_2, OR, and R', where R independently represents a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group, R' represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkenyl group, or a substituted or unsubstituted heterocyclic aromatic group,

Z represents an amine-containing moiety selected from tertiary amine groups substituted with at least one alkyl group having a hydrogen atom on the carbon atom adjacent to the amine nitrogen atom, and

L represents a group linking the amine-containing moiety to the triazine nucleus, provided that the amine nitrogen atom is not directly attached to the 1,3,5-triazine nucleus by a covalent bond or by a conjugated linkage.

4,985,563

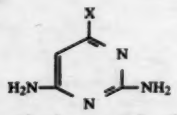
PROCESS FOR THE PREPARATION OF 6-PIPERIDINO-2,4-DIAMINO PYRIMIDINE-3-OXIDE

Jean Maignan, Tremblay-les-Gonesse; Serge Restle, Aulnay-sous-Bois, and Gerard Lang, Saint-Gratien, all of France, assignors to L'Oreal, Paris, France

Filed Jul. 29, 1988, Ser. No. 225,819
Claims priority, application Luxembourg, Jul. 31, 1987, 86.960
Int. Cl.[5] C07D 239/28
U.S. Cl. 544—320 6 Claims

1. A process for the preparation of a 6-piperidino-2,4-diaminopyrimidine-3-oxide comprising:

(a) producing a mixture of mono-ureas and di-ureas by blocking at least one of the amino groups of a compound having the formula:



(I)

by reaction in an aprotic solvent, at a temperature between about 40° and 100° C., with about one or more equivalents of isocyanate having the formula:

wherein X is a halogen atom and R is an alkyl group;

(b) oxidizing the products of step (a) to their respective 3-N-oxides in either

(i) metachloroperbenzoic acid in the presence of a mixture of water and an alcohol; or

(ii) a heterogeneous phase consisting of a mixture of a chlorinated solvent in the presence of formic acid or a mixture of formic acid and dioxan and an excess of oxygenated water of 2 to 5 equivalents with respect to the products of step (a), wherein the reactants are introduced at about 0° centigrade (C) and the reaction mixture is heated to at most about 70° C.;

(c) reacting the N-oxides produced in step (b) with at least 2 equivalents of piperidine and then rapidly cooling the reaction mixture to precipitate the reaction products; and

(d) eliminating the blocking urea group from the products of step (c) by contacting said products of step (c) with an excess of strong mineral or organic base until said products of step (c) disappear.

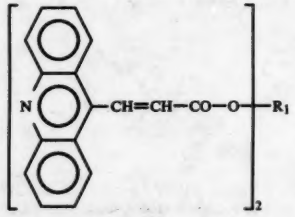
4,985,564

ACRIDINE COMPOUND AND PHOTOPOLYMERIZABLE COMPOSITION USING THE SAME

Hajime Kakumaru; Yoshitaka Minami, both of Hitachi; Naohiro Kubota, and Shinya Mashimo, both of Urawa, all of Japan, assignors to Hitachi Chemical Co., Ltd. and Adeka Argus Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1989, Ser. No. 401,794
Claims priority, application Japan, Sep. 3, 1988, 63-221138; Apr. 28, 1989, 1-111193
Int. Cl.[5] C07D 219/14
U.S. Cl. 546—104 9 Claims

1. An acridine compound of the formula:



wherein R_1 is a hydrocarbon group selected from the group consisting of an alkylene group, a cycloalkylene group, an arylene group and an arylalkylene group having 2 to 20 carbon atoms or $(R_2O)_nR_2$—in which; R_2 is an alkylene group having 2 to 4 carbon atoms; and n is an integer of 1 to 10.

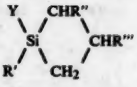
4,985,565

SILACYCLOBUTANES

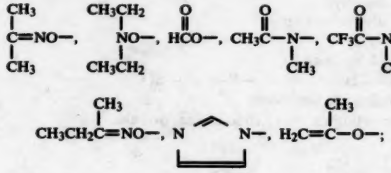
Ronald H. Baney; Carl J. Bilgrien; Lawrence D. Fiedler, and Chi-long Lee, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 422,207, Oct. 16, 1989, Pat. No. 4,965,367.
This application Jun. 18, 1990, Ser. No. 539,263
Int. Cl.[5] C07F 7/08, 7/10, 7/18
U.S. Cl. 548—110 19 Claims

1. Compounds of the formula



wherein R' is a monovalent substituted or unsubstituted hydrocarbon radical or Y group; R'' and R''' are independently hydrogen, monovalent substituted or unsubstituted hydrocarbon radicals; and Y is selected from:



and the disubstituted silacyclobutane wherein both Y and R' are

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4,985,566

BENZIMIDAZOLE-2-CARBOXANILIDES

Peter Spang, St. Ingbert; Peter Neumann, Mannheim, and Hubert Trauth, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

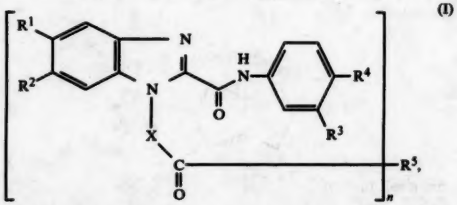
Division of Ser. No. 392,300, Aug. 11, 1989. This application May 18, 1990, Ser. No. 525,049

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1988, 3828535

Int. Cl.[5] C07D *235/30*

U.S. Cl. 548—328 **4 Claims**

1. A compound of the formula I



(I)

where

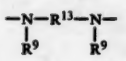
R^1 and R^2 are each independently of the other H, Cl, C_1–C_4-alkyl, C_1–C_4-alkoxy, unsubstituted or C_1–C_4-alkyl- or C_1–C_4-alkoxy-substituted phenyl or C_7–C_9-phenalkyl,

R^3 and R^4 are each independently of the other H, C_1–C_{18}-alkyl, C_3–C_{18}-alkyl which is interrupted one or more times by —O—, C_1–C_{18}-alkoxy, C_4–C_{18}-alkoxy which is interrupted one or more times by —O—, unsubstituted or C_1–C_4-alkyl- or C_1–C_4-alkoxy-substituted phenyl, C_7–C_{15}-phenylalkyl, phenoxy, C_7–C_{15}-phenylalkyloxy, C_1–C_4-hydroxyalkyl, C_1–C_4-hydroxyalkoxy, C_1–C_{12}-alkylcarbonylamino, C_1–C_{12}-alkanoyloxy, benzoylamino or benzoyloxy,

X is C_1–C_5-alkylene,

n is 2 and

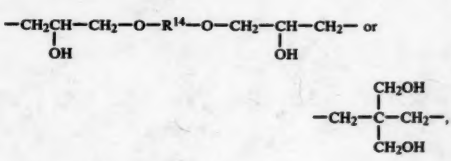
R^5 is a divalent radical of the formula —O—R^{12}—O— or



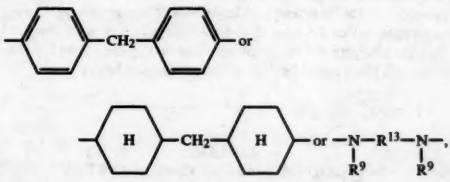
where

R^9 is H, C_1–C_{18}-alkyl, C_5–C_{12}-cycloalkyl, C_3–C_8-alkenyl, phenyl, naphthyl or C_7–C_{18}-phenylalkyl,

R^{12} is C_2–C_8-alkylene, C_4–C_8-alkenylene, cyclohexylene, C_4–C_{18}-alkylene which is interrupted one or more times by —O—,

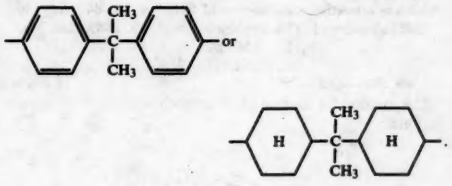


R^{13} is C_2–C_{12}-alkylene which may be interrupted one or more times by —O—, cyclohexylene,



a 2-valent piperazine radical, and

R^{14} is C_2–C_8-alkylene, C_4–C_{18}-alkylene which is interrupted one or more times by —O—, 1,3- or 1,4-cyclohexylene, 1,3- or 1,4-phenylene,



4,985,567

CHIRAL PHOSPHINOPYRROLIDINE COMPOUNDS AND THEIR USE FOR ASYMMETRIC SYNTHESIS OF OPTICALLY ACTIVE COMPOUNDS

Kazuo Achiwa, Shizuoka, and Hideo Takeda, Takaoka, both of Japan, assignors to Kazuo Achiwa, Shizuoka and Fuji Yakuhin Kogyo Kabushiki Kaisha, Toyama, both of, Japan

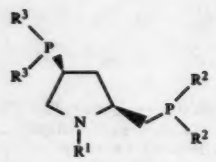
Filed Mar. 6, 1989, Ser. No. 319,186

Claims priority, application Japan, Mar. 7, 1988, 63-53384; Apr. 2, 1988, 63-81890; Oct. 4, 1988, 63-250290

Int. Cl.[5] C07F *69/6518*; C07B *53/00*; B01J *31/02*

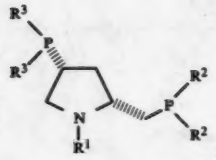
U.S. Cl. 548—412 **4 Claims**

1. Phosphinopyrrolidine compounds of the formula:



(I)

or



(I')

wherein R^1 is hydrogen, $—COA^1$, $—COOA^2$, $—CONHA^3$, $—SO_2A^4$ or $—PO(A^5)_2$, A^1, A^2, A^3, A^4 and A^5 each represents independently alkyl or aryl, R^2 is phenyl, di(lower-alkyl-)aminophenyl, lower-alkoxyphenyl or 3,5-dimethyl-4-methoxyphenyl, and R^3 is phenyl, di(lower-alkyl)aminophenyl, lower-alkoxyphenyl or 3,5-dimethyl-4-methoxyphenyl, with the proviso that R^2 and R^3 may not simultaneously be phenyl, p-di(lower-alkyl)aminophenyl or p-lower-alkoxyphenyl.

4,985,568

METHOD OF MAKING CROSSLINKING IMIDOPHENYLAMINES

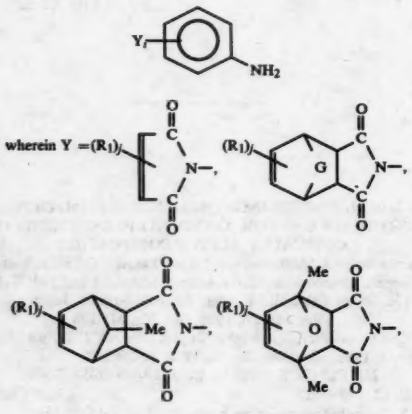
Hyman R. Lubowitz, Rolling Hills Estates, CA, and Clyde H. Sheppard, Bellevue, WA, assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 46,202, May 4, 1987, Pat. No. 4,935,523, which is a division of Ser. No. 865,228, May 20, 1986, abandoned, and a continuation-in-part of Ser. No. 865,228, , which is a continuation-in-part of Ser. No. 781,847, Sep. 30, 1985, abandoned. This application Apr. 28, 1989, Ser. No. 351,003

Int. Cl.[5] C07D *491/08*

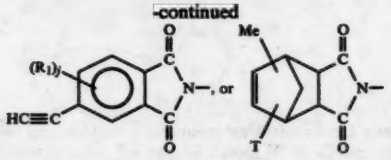
U.S. Cl. 548—431 **10 Claims**

1. A method for making an imidophenylamine of the general formula:



wherein Y =

-continued



R_1=lower alkyl, lower alkoxy, aryl, aryloxy, substituted alkyl, substituted aryl, halogen, or mixtures thereof;

Me=methyl;

T=allyl or methallyl;

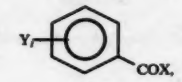
i=1 or 2;

j=0, 1, or 2; and

G=$—CH_2—$, —O—, —S—, or $—SO_2—$

comprising the steps of:

(a) reacting an acid halide of the formula:



wherein X=halogen, with ammonia to form an acid amide; and

(b) rearranging the acid amide to the amine.

4,985,569

PYRROLIZINE DERIVATIVE AND ITS MANUFACTURE

Masayasu Kurono; Yasuaki Kondo; Ryoichi Unno; Yukiharu Matsumoto; Hiromoto Kimura; Mitsuru Oka, and Kiichi Sawai, all of Aichi, Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Higashi, Japan

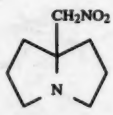
Filed May 12, 1989, Ser. No. 350,990

Claims priority, application Japan, Jun. 7, 1988, 63-138405

Int. Cl.[5] C07D *487/04*

U.S. Cl. 548—453 **2 Claims**

1. 7a-Nitromethyl-2,3,5,6,7,7a-hexahydro-1H-pyrrolizine of the formula



(I)

and a salt thereof.

4,985,570

PRODUCTION OF TETRAHYDROPHTHALIMIDE COMPOUND

Yuji Funaki, Toyonaka, and Masayuki Fukushima, Minoo, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

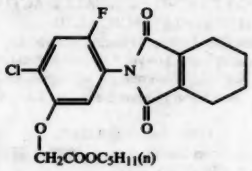
Filed Sep. 1, 1988, Ser. No. 239,470

Claims priority, application Japan, Sep. 1, 1987, 62-218608; Apr. 27, 1988, 63-107008

Int. Cl.[5] C07D *209/48*

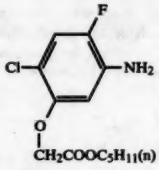
U.S. Cl. 548—513 **13 Claims**

1. A process for preparing a compound of the formula:



(I)

,which comprises reacting a compound of the formula:



(II)

selected from the group consisting of diethylamine, dibutylamine, diethanolamine, triethylamine, tributylamine, triethanolamine, N,N-dimethylaniline, N,N-diethylaniline, pyridine, piperidine, imidazole, morpholine, quinoline, and N,N-diethylaminopyridine;

with 3,4,5,6-tetrahydrophthalic anhydride in the presence of a catalyst system consisting of a nitrogen-containing base other that said compound (II) and a lower aliphatic acid selected from the group consisting of acetic acid, proprionic acid, and butyric acid.

4,985,571

6-MEMBERED LACTONES USEFUL AS INTERMEDIATES FOR ANTILIPEMIC MEVALONIC ACID LACTONES

Seiichi Takano, 1-16-4, Kamo, Sendai-shi, Miyagi-ken; Yohichi Shimazaki, Sendai; Yoshinori Sekiguchi, Sendai, and Kunio Ogasawara, Sendai, all of Japan, assignors to Seiichi Takano, Sendai, Japan

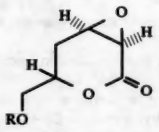
Filed Sep. 7, 1989, Ser. No. 404,204

Claims priority, application Japan, Oct. 1, 1988, 63-248545

Int. Cl.[5] C07D *493/04*

U.S. Cl. 549—283 **3 Claims**

1. A compound of the formula:



(II)

wherein R is an unsubstituted benzyl group, a p-nitrobenzyl group, a benzyl group in which the phenyl group is substituted by one or two substituents selected from the group consisting of C_1–C_4 alkyl groups and C_1–C_4 alkoxy groups, a phenyl group which is substituted by a C_1–C_4 alkylenedioxy group or by one or two substituents selected from the group consisting of C_1–C_4 alkyl groups and C_1–C_4 alkoxy groups, a C_1–C_4 trialkylsilyl group, a C_1–C_4 alkyldiarylsilyl group, a triarylmethyl group, a C_1-C_4 acyl group, a substituted or unsubstituted benzoyl group, a C_1–C_4 alkoxycarbonyl group, a substituted or unsubstituted aryloxycarbonyl group, a tetrahydropyranyl group, a benzyloxymethyl group, or a methoxymethyl group.

4,985,572

CATALYZED HYDROGENATION OF CARBOXYLIC ACIDS AND THEIR ANHYDRIDES TO ALCOHOLS AND/OR ESTERS

Melanie Kitson, and Peter S. Williams, both of Hull, England, assignors to The British Petroleum Company, p.l.c. and BP Chemicals Limited, London, both of, England

PCT No. PCT/GB88/00241, § 371 Date Nov. 21, 1988, § 102(e) Date Nov. 21, 1988, PCT Pub. No. WO88/07515, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 30, 1988, Ser. No. 282,312

Claims priority, application United Kingdom, Mar. 31, 1987, 8707595

Int. Cl.[5] C07D *307/20*; C07C *31/125, 67/08*

U.S. Cl. 549—326 **18 Claims**

1. A process for the production from either a carboxylic acid or an anhydride thereof of the corresponding alcohol and/or carboxylic acid ester which process comprises reacting the carboxylic acid or anhydride thereof with hydrogen at elevated temperature in the presence as catalyst of a composition comprising an alloy of (i) at least one noble metal of Group VIII of the Periodic Table of the Elements, and (ii) at least one metal capable of alloying with the aforesaid Group VIII noble metal.

11. A process for the production of gamma-butyrolactone from either maleic acid or maleic anhydride which process comprises reacting either maleic acid or maleic anhydride at elevated temperature with hydrogen in the presence as catalyst of a composition comprising an alloy (i) of at least one noble metal of Group VIII of the Periodic Table of the Elements and (ii) at least one metal capable of alloying with the noble metal.

4,985,573

HYDANTOIN DERIVATIVES FOR TREATING COMPLICATIONS OF DIABETES

Masayasu Kurono, Mie; Yasuaki Kondo, Kasugai; Takuji Yamaguchi, Kuwana; Kenji Miura, Kasugai; Toshinao Usui, Gifu; Naofumi Terada; Kyoichi Asano, both of Nagoya; Kuniharu Mizuno, Aichi; Akira Matsubara, Owari-asahi; Noriaki Kato, Kasugai; Kiichi Sawai, Funabashi; Ryoichi Unno, Nagoya; Hiroshi Ozawa, and Masato Fukushima, both of Nagoya, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Aichi, Japan

Division of Ser. No. 90,729, Aug. 28, 1987, Pat. No. 4,861,792. This application May 23, 1989, Ser. No. 355,623

Int. Cl.[5] C07D *311/24*

U.S. Cl. 549—402 **1 Claim**

1. d-6-Fluoro-3,4-dihydro-4-oxo-2H-benzopyran-2-carboxylic acid.

4,985,574

HYDANTOIN DERIVATIVES FOR TREATING COMPLICATIONS OF DIABETES

Masayasu Kurono, Mie; Yasuaki Kondo, Kasugai; Takuji Yamaguchi, Kuwana; Kenji Miura, Kasugai; Toshinao Usui, Gifu; Naofumi Terada; Kyoichi Asano, both of Nagoya; Kuniharu Mizuno, Aichi; Akira Matsubara, Owari; Noriaki Kato, Kasugai; Kiichi Sawai, Funabashi; Ryoichi Unno; Hiroshi Ozawa, both of Nagoya, and Masato Fukushima, Nagoya, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Aichi, Japan

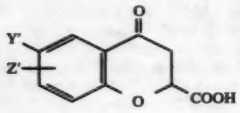
Division of Ser. No. 355,623, May 23, 1989, which is a division of Ser. No. 90,729, Aug. 28, 1987, Pat. No. 4,861,792. This application Nov. 22, 1989, Ser. No. 440,135

Claims priority, application Japan, Aug. 28, 1986, 61-199924; Nov. 14, 1986, 61-272612; Apr. 8, 1987, 62-84577

Int. Cl.[5] C07D *311/24*

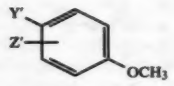
U.S. Cl. 549—402 **1 Claim**

1. A process for the preparation of optically active 3, 4-dihydro-4-oxo-2H-1-benzopyran-2-carboxylic acid compounds of the formula



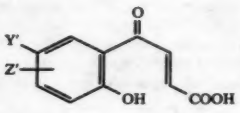
(II)

wherein Y' and Z' are each a hydrogen atom, a halogen atom or an alkyl group, which comprises reacting a compound of the formula



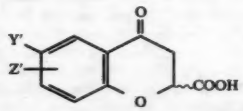
(III)

with maleic anhydride, causing with a base ring closure of the resulting compound of the formula



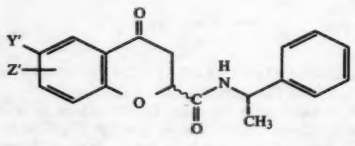
(IV)

activating the resulting compound of the formula



(II-a)

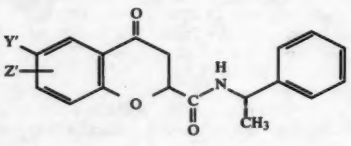
by converting it to its acid halide, reacting the activated compound with (S)-(−)-1-methylbenzylamine, subjecting the resulting diastereomer mixture of the formula



(V-a)

2

to fractional recrystallization, and then hydrolyzing the resulting (d)- and (l)-compounds of the formula



(V)

4,985,575

PROCESS FOR PREPARING OPTICALLY ACTIVE TETRAHYDRO-2-FUROIC ACID

Masaji Ishiguro; Hiromitsu Iwata; Takashi Nakatsuka, all of Osaka; Kiyoharu Nakayama, Tokyo; Osamu Miyahara, Toyama, and Kenichi Noguchi, Toyama, all of Japan, assignors to Suntory Limited, Osaka and Nippon Soda Co., Ltd., Tokyo, both of, Japan

Filed Feb. 6, 1990, Ser. No. 475,801

Claims priority, application Japan, Feb. 7, 1989, 1-28511

Int. Cl.[5] C07D *307/24*

U.S. Cl. 549—484 **5 Claims**

1. A process for preparing an optically active tetrahydro-2-furoic acid comprising:

reacting (±)-tetrahydro-2-furoic acid with an optically active amine resolver selected from the group consisting of 1-cyclohexylethylamine, 1-phenylethylamine, 1-(1naphthyl)ethylamine and 1-p-tolylethylamine,

(I)

thus, producing an optically active diastereomer salt, and decomposing the diastereomer salt.

4,985,576

BISINDENYL DERIVATIVE, AND A PROCESS FOR THE PREPARATION THEREOF

Jürgen Rohrmann, Liederbach, and Martin Antberg, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

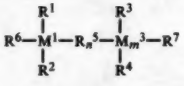
Filed Dec. 29, 1989, Ser. No. 458,346

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1988, 3844282

Int. Cl.[5] C07F *7/08, 7/18, 7/30*

U.S. Cl. 556—435 **12 Claims**

1. A bisindenyl derivative of the formula I



(I)

in which M^1 and M^3 are silicon or germanium wherein M^1 and M^3 can be identical or different,

m is zero or 1, n=zero when m=zero and n=zero or 1 when m=1,

R^1, R^2, R^3 and R^4 are identical or different and denote a hydrogen atom, a C_1–C_{30}-alkyl group, a C_2–C_{10}-alkenyl group, a C_6–C_{10}-aryl group, a C_7–C_{40}-arylalkyl group, a C_7–C_{40}-alkylaryl group, a C_8–C_{40}-arylalkenyl group, a C_1–C_{10}-alkoxy group, a C_6–C_{10}-aryloxy group, a halogenated C_1–C_{20}-alkyl group a halogenated C_6–C_{10}-aryl group or a halogen atom, or

R^1, R^2, R^3 and R^4, together with the atom connecting them, form a ring,

R^5 denotes a C_1–C_8-alkylene group, a C_6–C_{10}-arylene group, a C_7–C_{40}-arylalkylene group, a C_7–C_{40}-alkylarylene group, an $—O[Si(CH_3)_2—O]_p—$group in which p denotes an integer from 1 to 5, or a chalcogen atom, and

R^6 and R^7 are identical or different and denote an, unsubstituted or substituted indenyl radical, with the exception of 1,1'-(dimethylsilanediyl)-bisindenyl.

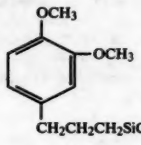
4,985,577

3-(3,4-DIMETHOXYPHENYL)PROPYLTRICHLOROSILANE

Toshio Shinohara, Takasaki, and Yoshifumi Inoue, Annaka, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1989, Ser. No. 371,780
Claims priority, application Japan, Jun. 28, 1988, 63-158118
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—445 1 Claim

1. 3-(3,4-Dimethoxyphenyl)propyltrichlorosilane, a compound represented by the formula,



4,985,578

PREPARATION OF MODIFIED POLYSILOXANES

Brian R. Trego, Dinas Powys, Wales, assignor to Dow Corning S.A., Valbonne, France

Filed Oct. 6, 1988, Ser. No. 253,640
Claims priority, application United Kingdom, Oct. 24, 1987, 8724957
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—457 9 Claims

1. A method of preparing a polysiloxane including at least one siloxane unit having a silicon-bonded group —OX which method comprises bringing about chemical reaction between a polymer having at least one siloxane unit having a silicon-bonded hydroxyl group and an alcohol of the general formula HOX, where X represents a hydrocarbon group in presence of an acidic condensation catalyst of the formula (i) RSO_3H in which R represents an alkyl, aryl or alkaryl group which may be halogenated at a temperature of less than 50° C. under conditions to cause condensation reaction between hydroxyl groups of the siloxane units and the alcohol.

4,985,579

REMOVAL OF HYDROGEN-CONTAINING SILANES FROM ORGANOSILANE MIXTURES

Gary N. Bokerman, Madison, Ind.; James E. Hampton, and John G. Uhlmann, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 422,191, Oct. 16, 1989, abandoned. This application Feb. 8, 1990, Ser. No. 478,720
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—466 26 Claims

1. A process for purification of an organosilane mixture by reducing hydrogen-containing silane content of the organosilane mixture, where the organosilane mixture contains, as a major portion, organosilane species which contain at least one substituent selected from a group consisting of alkyl radicals of 1 to 6 carbon atoms and phenyl; and

where the hydrogen-containing silane has a boiling point similar to that of at least one of the organosilane species; the process comprising:

(A) contacting the organosilane mixture, a hydrogen halide, and a catalyst; where the organosilane mixture comprises as the major portion the organosilane species and as a minor portion the hydrogen-containing silane; where the catalyst is selected from a group consisting of nickel and nickel compounds, each supported on a solid substrate;

(B) reacting the hydrogen-containing silane in the organosilane mixture with the hydrogen halide, in the presence of the catalyst, to form an altered organosilane mixture containing a more halogenated silane.

(C) isolating and recovering the organosilane species from the altered organosilane mixture.

4,985,580

ALKYLATION OF SILANES

Kirk M. Chadwick, Hanover, and Roland L. Halm, Madison, both of Ind., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 12, 1990, Ser. No. 491,806
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—481 32 Claims

1. A process for preparing more highly alkylated silanes having the formula,

$$R^1_aR_nSiH_{4-a-n}$$

where each R^1 is independently selected from a group consisting of alkyl and substituted alkyl; each R is independently selected from a group consisting of methyl, ethyl, and n-propyl; a=0, 1, 2, or 3; n=1, 2, 3, or 4; and a+n=1, 2, 3, or 4; said process comprising:

(A) contacting a silane having the formula,

$$R^1_aSiH_{4-a}$$

where R^1 and a are defined above; with an alkyl halide, having the formula,

$$RX$$

where R is defined above and X is a halogen atom, in the presence of a metal which serves as a halogen acceptor;

(B) reacting the silane with the alkyl halide in the presence of the metal at a temperature between 200° and 400° C. to form the more highly alkylated silane and a halide of the metal.

4,985,581

CATALYST AND PROCESS FOR PRODUCING AROMATIC NITRILES

Masao Saito, Tokyo; Kengo Tsukahara, Niigata; Noriko Takahashi, Niigata, and Yuzi Onda, Niigata, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 336,475
Claims priority, application Japan, Apr. 26, 1988, 63-101401
Int. Cl.[5] C07C 253/28
U.S. Cl. 558—327 6 Claims

1. A process for producing an aromatic nitrile comprising subjecting a gas mixture containing 0.5–5 % by volume of an alkyl-substituted aromatic compound selected from the group consisting of toluene, ethylbenzene, xylene, mesitylene, cymene, durene, diethylbenzene or methylnaphthalene, ammonia and oxygen or a gas containing molecular oxygen, to a catalytic reaction, at a reaction temperature of 300–500° C. for a contact time of 0.5–30 seconds, wherein the catalyst consists essentially of vanadium oxide, chromium oxide, molybdenum oxide and boron oxide in an atomic ratio of V:Cr:Mo:B of 1:0.5–2.0:0.01–1.2:0.01–1.2 and is supported 20–80 % by weight on a silica carrier.

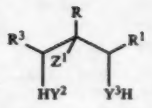
4,985,582

PESTICIDAL COMPOUNDS

John P. Larkin, Leighton Buzzard, England, assignor to The Wellcome Foundation Ltd., London, England

Continuation of Ser. No. 911,913, Sep. 22, 1986, abandoned. This application Sep. 1, 1989, Ser. No. 401,490
Claims priority, application United Kingdom, Sep. 24, 1985, 8523582; Jan. 6, 1986, 8600201
Int. Cl.[5] C07C 321/04
U.S. Cl. 558—388 1 Claim

1. A compound of the formula:



wherein R is propyl, butyl, pentyl, C_{2-5} alkenyl or alkynyl, C_{3-10} cycloalkyl, phenyl or phenyl substituted by halo;

R^1 is hydrogen, cyano, C_{2-3} alkynyl, methyl, ethyl, methyl or ethyl substituted by fluoro, cyano, methoxy or methylthio;

R^3 is hydrogen;

Y^2 and Y^3 are each S; and

Z^1 is CH_2SH.

4,985,583

CYCLOHEXANE DERIVATIVES

Rudolf Eidenschink, Münster; Joachim Krause, Dieburg; Andreas Wächtler, Griesheim; Reinhard Hittich, Modautal; Bernhard Scheuble, Alsbach; Georg Weber, Erzhausen, and Hans-Adolf Kurmeier, Seeheim-Jugenheim, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 705,811, Feb. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 526,927, Aug. 26, 1983, Pat. No. 4,510,069. This application Apr. 7, 1987, Ser. No. 35,548

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1982, 3231707; Jun. 3, 1983, 3320024; Feb. 27, 1984, 3407013

Int. Cl.[5] C07C *255/00*; C09K *19/52*

U.S. Cl. 558—431 **33 Claims**

1. A cyclohexane derivative of the formula

$$R^1—A^1—Z^1—A^2—R^2$$

wherein

R^1 and R^2 independently are (a) C_{1-15}-alkyl, (b) C_{1-15}-alkyl substituted by halo or CN, (c) C_{1-15}-alkyl wherein one or two non-adjacent CH_2 groups are replaced by at least one of —O—, —CO—, —O—CO—, —CO—O—, —C≡C—, —CH=CH—, —S—, the maximum number of C-atoms still being 15, (d) F, (e) Cl, (f) Br, (g) CN or (h) $R^3—(A^3)_p—Z^2—$,

A^1 is —A—, $—A^4—Z^3—A—$ or $—A—Z^3—A^4—$,

A is 1,4-cyclohexylene which is additionally substituted in the 1- or 4-position by CN,

A^2, A^3 in each case independently are (a) 1,4-and A^4 phenylene, (b) 1,4-phenylene substituted by one or two F, Cl, CH_3 or CN, (c) any of groups (a) or (b) wherein one or two CH groups are replaced by N atoms, (d) 1,4-cyclohexylene, (e) 1,4-cyclohexylene wherein one or two non-adjacent CH_2 groups are replaced by O-atoms, (f) 1,4-cyclohex-1-enyl,

Z^1, Z^2 each independently are —CO—O—, —O—CO—, and Z^3 $—OCH_2—$, $—CH_2O—$, $—CH_2CH_2—$or a single bond,

R^3 is (a) C_{1-15}-alkyl, (b) C_{1-15}-alkyl, substituted by halo or CN, (c) a group (a)-(b) wherein one or two non-adjacent CH_2 groups are replaced by one of —O—, —CO—, —O—CO—, —CO—O—, —C≡C—, —CH=CH—or —S—, the maximum number of C-atoms still being 15, (d) F, (e) Cl, (f) Br or (g) CN and

is 1 or 2,

and when p=2, the groups A^3 can be identical or different.

4,985,584

PROCESS FOR THE PRODUCTION OF HIGH ENERGY MATERIALS

Ross W. Millar; Norman C. Paul, both of Hertfordshire, and David H. Richards, Essex, all of England, assignors to Secretary of State for Defence, London, England

Continuation-in-part of Ser. No. 887,990, Jun. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 794,340, Nov. 5, 1985, Pat. No. 4,820,859, which is a continuation of Ser. No. 507,170, Jun. 27, 1983, abandoned. This application Oct. 27, 1986, Ser. No. 923,054

Claims priority, application United Kingdom, Jul. 15, 1982, 8220082; Oct. 25, 1985, 8526387; Nov. 26, 1985, 8529094

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[5] C07C *77/02*

U.S. Cl. 558—483 **25 Claims**

1. A process for the production of a high energy material comprising the following steps:

(a) reacting a heterocyclic strained ring compound, selected from the group consisting of oxiranes, oxetanes, aziridines and azetidines, with a nitrogen oxide selected from the group consisting of dinitrogen tetroxide (N_2O_4) and dinitrogen pentoxide (N_2O_5) to open said heterocyclic strained ring and afford, when the nitrogen oxide is N_2O_4, a product A containing nitrato (—ONO_2) and nitrito (—ONO) substituents or a product B containing nitrato and N-nitroso (>NNO) substituents, and afford, when the nitrogen oxide is N_2O_5, a product C containing nitrato substituents or a product D containing nitrato and N-nitro (>NNO_2) substituents;

(b) when the nitrogen oxide is N_2O_4, oxidising with ozone product A to product C or product B to product D; and

(c) isolating product C or product D.

4,985,585

PHENOXYALKYLCARBOXYLIC ACID DERIVATIVES AND PROCESS FOR THEIR PREPARATIONS

Mitsuo Ohashi, Ohmiya; Katsuya Awano, Oyama; Toshio Tanaka, and Tetsuya Kimura, both of Tochigi, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

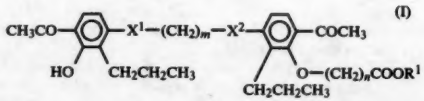
Filed Feb. 23, 1989, Ser. No. 313,900

Claims priority, application Japan, Mar. 7, 1988, 63-53374

Int. Cl.[5] C07C *321/00*

U.S. Cl. 560—9 **1 Claim**

1. A phenoxyalkylcarboxylic acid derivative represented by the following general formula (I),



(I)

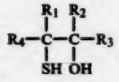
wherein R^1 indicates hydrogen atom, methyl group or ethyl group, m is an integer from 2 to 5, n is an integer from 3 to 8, and X^1 and X^2 each independently represent sulfur atom, oxygen atom, sulfinyl group or sulfonyl group, proviso X^1 and X^2 are not simultaneously oxygen atom; their alkali salt or hydrate.

4,985,586
PROCESS FOR THE PREPARATION OF MERCAPTOALCOHOLS

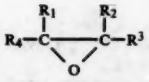
Emmanuel Arretz, Pau; Patrick Auge, Billere; Alfred Mirassou, Lescar, and Claude Landoussy, Pau, all of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Continuation of Ser. No. 133,617, Dec. 16, 1987, abandoned. This application Jan. 10, 1990, Ser. No. 462,987
Claims priority, application France, Dec. 30, 1986, 86 18323
Int. Cl.[5] C07C *331/00*
U.S. Cl. 560—18 **24 Claims**

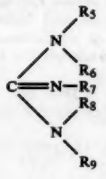
1. A process for preparing a mercaptoalcohol of formula:



containing up to 24 carbon atoms, comprising reacting hydrogen sulphide with the corresponding vicinal epoxide, of formula:



wherein R_1, R_2, R_3 and R_4 denote hydrogen, halogen, a hydroxyl; a C_1–C_{22} alkyl, haloalkyl or hydroxyalkyl; C_2–C_{22} alkoxyalkyl, alkoxyhaloalkyl; alkoxyaryl which may be optionally substituted by one or more alkyl, halogen, hydroxyl, alkoxy or carboxyl groups or their aliphatic esters; C_3–C_{22} alkenyl; C_5–C_{12} cycloalkyl or cycloalkenyl; C_6–C_{18} aryl or haloaryl; C_7–C_{19} aralkyl, alkylaryl; and when R_1 and R_2 are taken together they may denote a C_3–C_{10} alkylene, the reaction is carried out in the presence of a catalyst selected from the group consisting of guanidine, guanidine carbonate, guanidine hydrochloride, guanidine sulphate, guanidine nitrate, guanidine thiocyanate, and guanidine derivatives of formula:



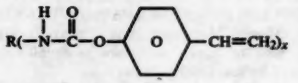
in which R_5, R_6, R_7, R_8 and R_9 may denote hydrogen atoms or a C_1–C_8 alkyl, C_2–C_8 alkenyl, C_5–C_{12} cycloaliphatic or C_6–C_{14} aromatic radicals, each of the carbon-containing radicals optionally including a halogen, hydroxyl or ether group, and recovering said mercaptoalcohol.

4,985,587
REACTION PRODUCTS OF P-VINYLPHENOL AND POLYISOCYANATES

James W. Watkins, 9007 Spruce Tree Pl., Louisville, Ky. 40222, and Darrell D. Hicks, 3500 Wilderness Trail, Jeffersontown, Ky. 40299

Filed Oct. 29, 1987, Ser. No. 113,902
Int. Cl.[5] C07C *261/00*
U.S. Cl. 560—25 **6 Claims**

1. A polymerizable polyethylenically unsaturated oligomer of the formula:



wherein x is an integer having the value of 2 to 4 and R is an organic radical having a valence equal to x, wherein R is the nucleus, after removal of the isocyanate groups of

A. an aliphatic, aromatic, polyaromatic, aralkyl, alkaryl, or cycloaliphatic di, tri, or tetraisocyanate, or

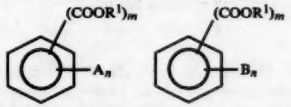
B. a prepolymer of an aliphatic, aromatic, aralkyl, alkaryl or cycloaliphatic diisocyanate and a polyol reacted in the ratio of one mole of diisocyanate for each hydroxyl group of the polyol, wherein the polyol is an -aliphatic hydrocarbon diol, triol or tetraol or a polyether or a polyester diol or triol.

4,985,588
NUCLEUS-FLUORINATED AROMATIC CARBOXYLATES AND PROCESSES FOR THEIR PRODUCTION

Seisaku Kumai, Fujisawa, and Osamu Yokokouji, Yokohama, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 405,430
Claims priority, application Japan, Aug. 26, 1988, 63-210803
Int. Cl.[5] C07C *69/76*
U.S. Cl. 560—103 **18 Claims**

1. A process for producing nucleus-fluorinated aromatic carboxylates, which comprise nucleus-fluorinating aromatic carboxylates of the following formula (1) with a fluorinating agent comprising an alkali metal fluoride in an amount of from 1 to 5 mols per mole of halogen atom to be substituted, at a temperature of from 50° to 250° C., to obtain nucleus-fluorinated aromatic carboxylates of the following formula (2):



(1) (2)

wherein R^1 is an alkyl group, an aryl group or a fluoroalkyl group, each of A and B is at least one member selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group, an aryl group and a fluoroalkyl group, and n and m are integers satisfying m+n=6, provided that m is 1 or 2, provided that at least one A is an activated chlorine or bromine atom, and B corresponding to such an activated chlorine or bromine atom is a fluorine atom.

4,985,589
(1S-CIS)-3-(4-HYDROXYPHENYL),5-CYCLOHEXADIENE-1,2-DIOL AND CORRESPONDING ACETATE

Bruce F. Johnson, Scotia, and Frank J. Mondello, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 453,895, Dec. 20, 1989. This application Aug. 1, 1990, Ser. No. 561,648
Int. Cl.[5] C07C *69/013, 39/17*
U.S. Cl. 560—130 **2 Claims**

1. The compound (1S-cis)-3-(4-hydroxyphenyl)-3,5-cyclohexadiene-1,2-diol.

2. The compound (1S-cis)-3-(4-acetoxyphenyl)-3,5-cyclohexadiene-1,2-diacetate.

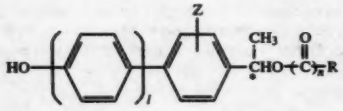
4,985,590

OPTICALLY ACTIVE BENZENE DERIVATIVES AND PROCESS FOR PREPARATION THEREOF

Masayoshi Minai, Moriyama, and Takayuki Higashi, Kishiwada, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 18, 1988, Ser. No. 182,461
Claims priority, application Japan, Apr. 21, 1987, 62-99051; May 9, 1987, 62-113270
Int. Cl.[5] C07C 69/66
U.S. Cl. 560—184 39 Claims

1. Optically active benzene derivatives represented by the formula (I):



(I)

wherein R represents an alkyl or alkoxyalkyl group having 1 to 20 carbon atoms, which group may contain a halogen; Z represents a hydrogen atom or a halogen atom; l and n each represents a number of 0 or 1; and * indicates asymmetric carbon atom.

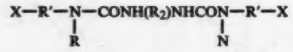
4,985,591

ACID CATALYSTS FOR LOW TEMPERATURE CURE OF COATING COMPOSITIONS

Jozef T. Huybrechts, Oud-Turnhout, Belgium, and Werner Zimmt, Bala Cynwyd, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 15, 1988, Ser. No. 233,456
Int. Cl.[5] C07C 143/02; C07F 9/02
U.S. Cl. 562—102 5 Claims

1. A process making a semi-crystalline catalyst having the structure:



where X is SO_3H, PO_4H, or PO_4H_2, R is H or methyl and R' is an alkylene group containing hetero atoms in the form of ester or amide and R_2 is an alkylene group by the process of steps of

(A) Michael addition reaction of a mono functional primary amine to an α,β-unsaturated compound based on an ester or amide chemical linkage and containing a sulfonic or phosphoric acid group followed by

(B) reaction with a di- or polyfunctional isocyanate.

4,985,592

PROCESS FOR THE PREPARATION OF UNSATURATED CARBOXYLIC ACIDS

Hiromichi Ishii; Hideo Matsuzawa; Masao Kobayashi, and Kazuhiro Ishii, all of Otake, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 666,565, Mar. 15, 1976, abandoned. This application Oct. 17, 1978, Ser. No. 952,111
Claims priority, application Japan, Mar. 17, 1975, 50-31055; Aug. 1, 1975, 50-94512
Int. Cl.[5] C07C 51/25, 57/055
U.S. Cl. 562—534 7 Claims

1. A process for the preparation of unsaturated carboxylic acids, which comprises catalytically oxidizing acrolein or methacrolein in the gas phase at a temperature of 200° to 500° C. with molecular oxygen to form the corresponding unsaturated carboxylic acids in the presence of a catalyst of the following formula:

$$Mo_{12}P_aX_bY_cZ_dO_e$$

wherein the subscripts represent the atomic ratio of each component and a is 0.5 to 6, b is 0.001 to 6, c is 0.2 to 6, d is 0 to 6, and e is a value determined by the valencies of the elements present in the catalyst; and wherein Mo is molybdenum, P is phosphorus, O is oxygen, X is rhodium, Y is at least one alkali metal selected from the group consisting of potassium, rubidium and cesium, and Z is at least one metal selected from the group consisting of iron, cobalt, nickel, zinc, antimony, silicon, bismuth, cadmium, uranium, manganese, copper, vanadium, niobium and tantalum.

4,985,593

MAGNESIUM POTASSIUM CITRATE

Neill B. Walsdorf, and George Alexandrides, both of San Antonio, Tex., assignors to Mission Pharmacal Company, Inc., San Antonio, Tex.

Filed Jan. 5, 1988, Ser. No. 140,818
Int. Cl.[5] C07C 59/265
U.S. Cl. 562—584 9 Claims

1. A pharmaceutical composition useful as a magnesium and potassium dietary supplement, said composition comprising high bulk density magnesium potassium citrate as a single salt having a ratio of magnesium ion to potassium ion to citrate ion of about 1:4:2.

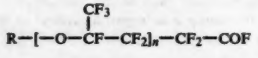
4,985,594

PROCESS FOR THE PREPARATION OF FLUORINATED CARBOXYLIC ACID FLUORIDES

Peter Blickle, Taunus; Klaus Hintzer, Burgkirchen; Werner Schwertfeger, Langgöns, and Heinz Strutz, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

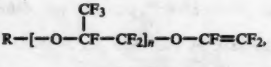
Filed Aug. 3, 1989, Ser. No. 389,271
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1988, 3826808
Int. Cl.[5] C07C 51/62
U.S. Cl. 562—851 9 Claims

1. A process for the preparation of a fluorinated carboxylic acid fluoride of the Formula I



(I)

in which R denotes a branched or straight-chain perfluorinated radical having 1–10 carbon atoms, in which one or more fluorine atoms can be replaced by other halogen atoms or hydrogen or another functional group, and n is an integer from zero to 10, which comprises heating a vinyl ether of the Formula II



(II)

where R and n are as in Formula I, in an inert gas atmosphere or inert halogenated solvent to a temperature of 100° C. to 350° C.

4,985,595

AMINOBENZAMIDE DERIVATIVES

Tosaku Miki; Masahide Asano, and Toru Hosokami, all of Tokyo, Japan, assignors to Daiichi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 65,815, Jun. 24, 1987, abandoned, which is a continuation of Ser. No. 804,723, Dec. 5, 1985, abandoned. This application Dec. 1, 1988, Ser. No. 279,256
Claims priority, application Japan, Dec. 18, 1984, 266828
Int. Cl.[5] C07C *237/44, 271/28, 309/24;* A61K *31/165*
U.S. Cl. 564—157 1 Claim

1. 3-((2-((2-(3,4-Dimethoxyphenyl)ethyl)amino)-2-oxoethyl-)amino)-N-methylbenzamide or the pharmaceutically acceptable salt thereof.

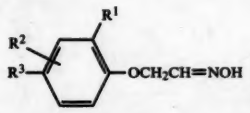
4,985,596

PROCESS FOR PRODUCING SUBSTITUTED PHENOXYETHYLAMINES OXIME

Kikuo Ataka; Koji Imaoka; Kiyotaka Yoshii, all of Ube, and Kenji Hirotsu, Yamaguchi, all of Japan, assignors to UBE Industries, Ltd., Ube and Sankyo Co., Ltd., Tokyo, both of, Japan

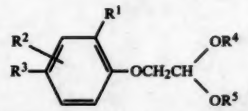
Filed Aug. 21, 1989, Ser. No. 397,179
Claims priority, application Japan, Aug. 30, 1988, 63-213636
Int. Cl.[5] C07C *251/36*
U.S. Cl. 564—258 23 Claims

1. A process for producing a substituted phenoxyacetaldehyde oxime of the formula:



(II)

wherein R^1 and R^2 each represent a hydrogen atom or a lower alkyl group, R^3 represents a hydrogen atom or a $—CH_2CH_2O—R^6$ group, where, R^5 is a hydrogen atom or a lower alkyl group, which comprises contacting a substituted phenoxyacetaldehyde dialkylacetal of the formula:



(I)

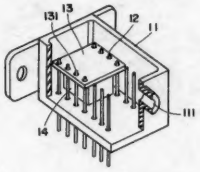
wherein R^4 and R^5 each represent a lower alkyl group with a hydroxylamine to provide a reaction mixture and reacting said dialkylacetal with said hydroxylamine while maintaining the pH of the reaction mixture at from 0.1 to 1.0.

4,985,597

OPTICAL SEMICONDUCTOR DEVICE

Takeshi Sekiguchi; Nobuo Shiga, and Keigo Aga, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 12, 1989, Ser. No. 351,033
Claims priority, application Japan, May 16, 1988, 63-118947
Int. Cl.[5] H01L *23/055*
U.S. Cl. 174—52.4 19 Claims



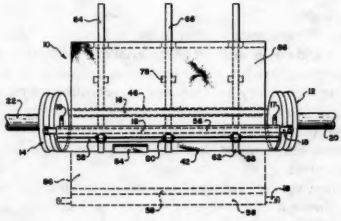
1. An optical semiconductor device comprising:
an insulating substrate on which a hybrid integrated circuit including an optical semiconductor element is provided and in which terminal pin insertion holes are provided,
a package housing said insulating substrate therein,
a supporting block, provided within said package, for supporting said insulating substrate on the lower surface of said substrate, and
terminal pins extending from an inner bottom of the package substantially perpendicularly to the upper surface of said insulating substrate, each terminal pin passing through the corresponding terminal pin hole from the lower surface of said insulating substrate to terminate substantially perpendicular to said upper surface and to be electrically connected to said hybrid integrated circuit.

4,985,598

APPARATUS AND METHOD FOR SUPPORTING A CABLE SPLICE IN A CABLE SPLICE ENCLOSURE

Svetko Bubica, 1820 - 126th Street, Surrey, British Columbia, Canada V4A 3P5 , and Mervyn J. Leik, 14427 - 17th Avenue, White Rock, British Columbia, Canada V4A 1T6

Filed Oct. 30, 1989, Ser. No. 428,943
Int. Cl.[5] H02G *15/113, 1/14*
U.S. Cl. 174—93 19 Claims



1. An apparatus comprising:
(a) a rectangular cradle portion of flexible net having first and second parallel opposite longitudinal sides and first and second parallel opposite transverse sides interconnecting the first and second longitudinal sides, and first and second parallel, spaced apart sleeves disposed on and extending longitudinally of the cradle portion;
(b) a cover portion of flexible net having first and second opposite cover sides, the first cover side being connected to the cradle portion;
(c) cover connecting means for releasably connecting the second side of the cover portion to the cradle portion.

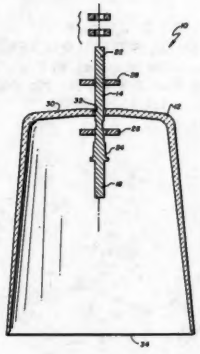
13. A method of supporting a cable splice between first and second torque bars of a cable splice enclosure, the method including the steps of:
(a) providing a rectangular cradle portion and a rectangular cover portion of flexible net;
(b) securing the cradle portion between the first and second torque bars so that the cradle portion extends under the cable splice;
(c) passing the cover portion over the cable splice towards the second torque bar; and
(d) tightening the cover portion over the splice to draw the splice radially inwardly within the enclosure.

4,985,599

TRANSFORMER BUSHING CAP

Robert E. Eggleston, Rt. 1, Box 909, Manteo, N.C. 27954

Filed Oct. 18, 1988, Ser. No. 259,303
Int. Cl.[5] H01B *17/00*
U.S. Cl. 174—138 F 7 Claims



1. A cap for an insulated bushing of an electrical conductor for protecting the bushing from airborne contaminants, comprising:
a non-conductive cap element having a closed end and an open end and a mounting aperture defined through said closed end;
a stem element having a longitudinal axis, a first end including means for coupling to an exposed end of the electrical conductor, said stem being received in said mounting aperture and being fixedly coupled to said cap element, said stem including a circumferential flange; and
a sealing disk slidably mounted to said stem element and size to engage said flange element to provide a sealing coupling between said cap element and said stem.

4,985,600

PRINTED CIRCUIT BOARD HAVING AN INJECTION MOLDED SUBSTRATE

Marcel Heerman, Merelbeke, Belgium, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 13, 1989, Ser. No. 406,551
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833297
Int. Cl.[5] H05K *1/00, 3/10*
U.S. Cl. 174—255 14 Claims

1. A printed circuit board comprising:
an injection molded substrate having a surface;
a pattern of interconnect traces, through-connections and connecting pads recessed in said substrate surface formed

by trench-shaped depressions in the region of each interconnect trace and by planar depressions in at least one of (a) the region of each through-connection or (b) the region of each connecting pad; and

said planar and trench-shaped depressions having a conductive metal coat, the width of each trench-shaped depression being dimensioned narrowly in comparison to the width of each planar depression so that said metal coat fills each trench-shaped depression to the surface of the substrate, and in each planar depression a distance remains between the metal coat and the surface of the substrate.

5. A method for manufacturing a circuit board comprising:

generating a pattern of recesses in a surface of a substrate by forming a trench-shaped depression in the region of each interconnect trace and by forming a planar depression in at least one of (a) the region of each through-connection or (b) the region of each connecting pad, with each trench-shaped depression being narrow in comparison to each planar depression; and

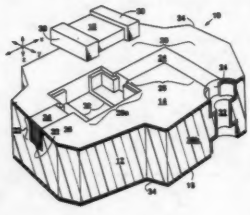
applying a metal coat to said substrate so that said metal coat fills each trench-shaped depression to the surface of the substrate and in each planar depression a distance remains between said metal coat and said surface of said substrate.

4,985,601

CIRCUIT BOARDS WITH RECESSED TRACES

George R. Hagner, 6800 Montana, El Paso, Tex. 79925

Filed May 2, 1989, Ser. No. 346,220
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—261 29 Claims



1. A reflowable material core circuit board for receiving electronic components comprising:

an insulative substrate having at least one mounting surface; and

a conductive material pattern positioned over the surface of the insulative substrate and at least partially within the mounting surface, the pattern comprising:

a groove within the mounting surface; and

a reflowable, conductive material at least partially filling the groove, where the reflowable, conductive material is present before the electronic components are received on the board.

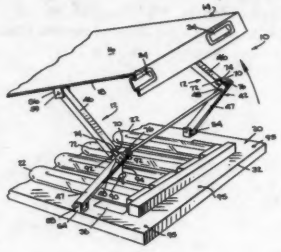
4,985,602

SELF-LOCKING SUPPORT FOR DIGITIZER COVER

Kenneth Kouhia, Danbury, Conn., assignor to Summagraphics Corporation, Seymour, Conn.

Filed Jul. 13, 1989, Ser. No. 379,050
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—18 22 Claims

1. A digitizer tablet comprising a cover, a base structure, means pivotably connecting said cover and said base structure such that said cover may be pivoted relative to said base structure between a closed position in which said cover and said base structure define an enclosure substantially closed on all sides and an open position in which access is provided to portions of said digitizer tablet which are enclosed in the closed position of said digitizer tablet, and a support coupled to said cover and to said base structure for automatically locking and holding said cover open in said open position when said cover has been pivoted to said open position, said support



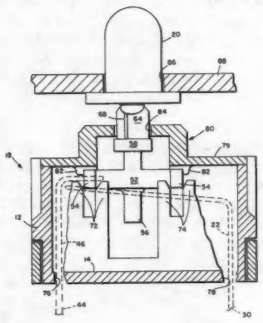
being constructed such that when locked in said open position said support must be unlocked to allow a closing movement of said cover.

4,985,603

ELECTRIC SWITCH HAVING REDUCED ACTUATOR PLAY

Thomas F. Prince, 1175 Brook Rd., Milton, Mass. 02186

Filed Nov. 24, 1989, Ser. No. 440,687
Int. Cl.[5] H01H *3/12, 3/48, 13/70*
U.S. Cl. 200—341 7 Claims



1. An electric switch comprising

a case and cover molded of material exhibiting unpredictable shrinkage within a known range, resulting in unpredictable variability in case and cover dimensions which is significant with respect to acceptable design tolerances, said case providing a floor,

at least one contact assembly supported in said case and comprising

a first contact terminal having a terminal end extending through said case, said first contact terminal carrying a first contact,

a second contact terminal having a terminal end extending through said case, and having an arm carrying a second contact, said second contact terminal arm being movable between two positions, in one of which said first and second contacts are maintained in electrical connection, in the other of which said first and second contacts are maintained out of electrical connection,

a contact actuator having an axis generally normal to said case floor, having

guide bosses spaced away from said actuator axis, means adjacent said guide bosses for moving said

second contact terminal movable arm between said two positions, and

an axial barrel axially spaced from said guide bosses, and providing a plurality of equally spaced external axially extending sharp bearing ridges,

said case providing case guide structure cooperating with said actuator guide bosses to permit actuator travel generally normal to said case floor, said actuator being dimensioned with respect to said case guide structure to accommodate said unpredictable case material shrinkage variability and thereby permitting actuator play in which said actuator axis is rotatable out of a normal to the case floor,

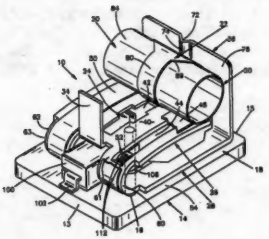
said switch cover providing an actuator collar having an inner surface coaxial with a normal to said case floor and dimensioned with respect to said actuator barrel such that for all shrinkage values within said known range, said actuator barrel bearing ridges interfere with said collar inner surface for reduction of said actuator play with minimal friction between said barrel and said plurality of actuator collar.

4,985,604

ROLAMITE SENSOR

Yosufi M. Tyebkhan, San Dimas, Calif., assignor to TRW Technar Inc., Irwindale, Calif.

Filed Oct. 10, 1989, Ser. No. 419,013
Int. Cl.[5] H01H *1/16*
U.S. Cl. 200—503 **22 Claims**



1. An apparatus comprising:

a movable member;

an electrically conductive sheet metal base having a guide surface thereon defining a path for movement of said movable member, said movable member being movable along said guide surface from a first position due to a force acting on said movable member;

a band of flexible, electrically conductive material at least partially encircling said movable member, said band extending in opposite directions away from said movable member and having opposite ends connected to said base; and

an electrically conductive member at a location spaced from said movable member when said movable member is in said first position and in the path of movement of said movable member;

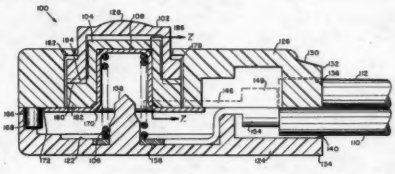
said movable member being movable along said guide surface from said first position to a second position in which a portion of said band contacts said conductive member to complete a circuit for electrical current through said conductive member, said band, and said sheet metal base.

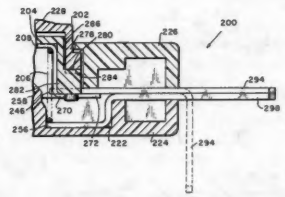
4,985,605

COMPACT SWITCHING APPARATUS AND METHOD OF CONSTRUCTION

Joseph F. Valenzona, El Toro, Calif., assignor to Judco Manufacturing, Incorporated, Harbor City, Calif.

Continuation of Ser. No. 214,420, Jul. 1, 1988, abandoned. This application Nov. 17, 1989, Ser. No. 437,327
Int. Cl.[5] H01H *13/58*
U.S. Cl. 200—528 **13 Claims**





1. A compact switching apparatus for connecting and disconnecting an electrical circuit, comprising:

a housing defined by a top body portion and a bottom cover portion having an inner surface;

a first electrical terminal terminating on the inner surface of the bottom cover portion of said housing;

a second electrical terminal terminating within the top body portion of said housing;

an electrically conductive contact cup rotatably disposed within said housing in electrical contact with said second electrical terminal only when in a predefined rotational orientation, said contact cup having at least one recess provided therein;

an electrically conductive spring in compression between said conductive contact cup and said first electrical terminal said spring causing said contact cup to be in electrical communication with said first electrical terminal;

a plunger slidably mounted and projecting from said top body portion of said housing; and

ratchet means coupled to said plunger and having at least one extension member disposed thereon coupled to said at least one recess provided in said contact cup to lock the ratchet means and contact cup together for converting depression of said plunger into a preselected amount of rotation of said contact cup.

4,985,606

MULTI-PLY FILM SUSCEPTOR FOR MICROWAVE COOKING

Rudolph Faller, 7101 Mark Terrace Dr., Edina, Minn. 55435

Continuation of Ser. No. 252,594, Oct. 3, 1988, abandoned. This application Nov. 1, 1989, Ser. No. 430,966
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 E **13 Claims**

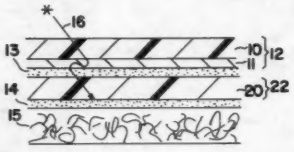
1. A multi-ply susceptor for microwave cooking comprising:

a substantially planar first layer having a first microwave-transmissive plastic film capable of withstanding high temperatures encountered in microwave cooking, said

first layer having an upper surface on which food to be cooked is placed and which is exposed to microwave radiation impinging thereon and passing therethrough to a lower surface thereof;

at least a second layer having a second plastic film capable of withstanding microwave cooking temperatures disposed in parallel below said first layer;

a thin metal coating of microwave-sensitive metal located below and deposited in contact with said lower surface of said first layer and sandwiched between said first layer and an upper surface of said second layer, wherein said thin metal coating is deposited in an amount which results in about 50%–65% light transmission, such that a part of the microwave radiation passing through said first layer is



absorbed in said thin metal coating and converted to heat energy which is radiated back upward to the food-contacting upper surface of said first layer, and a remaining part of the microwave radiation is transmitted to said second layer; and

a thermally and dimensionally stable substrate below said second layer on which a lower surface of said second layer is supported,

wherein microwave radiation is transmitted through said first plastic film and converted into heat by said thin metal coating, and said second layer acts as a heat buffer to collect and distribute heat generated by said thin metal coating to said first layer so that surface cracking or crazing of the upper surface of said first layer in contact with the food to be cooked is reduced.

4,985,607

HIGH FREQUENCY HEATING APPARATUS HAVING DETACHABLE ROTATABLE SKEWER

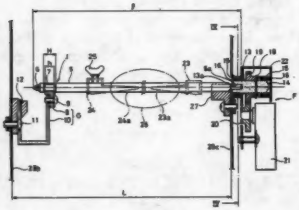
Yuichiro Oya, Sennan, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 30, 1988, Ser. No. 251,811

Claims priority, application Japan, Oct. 2, 1987, 62-151881[U]

Int. Cl.[5] H05B *6/78*

U.S. Cl. 219—10.55 E **23 Claims**



1. A heating apparatus comprising:

a heating chamber having at least two opposing sidewalls spaced apart by a predetermined distance, said heating chamber heating food introduced therein by at least one of a high frequency source and a heater;

support means for supporting the food which is skewered thereon, said support means being rotatively suspended between the sidewalls of the heating chamber, the support means having a length which is shorter than the predetermined distance between the sidewalls;

rotary driving means for rotating said support means in said heating chamber;

coupling means provided outside of one of said sidewalls of said heating chamber for coupling an end portion of said support means with said rotary driving means; and

a support member arranged at a position opposing said coupling means, said support member being readily detachably mounted on a sidewall opposite the one sidewall on which said coupling means is provided, said support member being detachably mounted on the sidewall by at least one fixing screw projecting from the sidewall, the support member having at least one notch defined therein for slidably receiving the fixing screw upon mounting of the sidewall, said support member rotatively supporting an other end portion of the support means opposite to the end portion coupled to the coupling means, a tip of the other end portion of the support means being spaced from the sidewall of the heating chamber when the support means is supported by the support member, and said support member further having a recess defined in a top portion thereof for receiving the tip of the other end portion of the support means.

4,985,608

METHOD OF POSITIONING A WIRE ELECTRODE AND A WORKPIECE RELATIVE TO EACH OTHER IN A WIRE CUT ELECTRIC DISCHARGE MACHINE

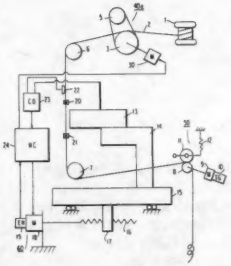
Hiroaki Morishita; Jun Aramaki, both of Aichi, and Masao Tomisawa, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1989, Ser. No. 445,056

Claims priority, application Japan, Dec. 9, 1988, 63-311552

Int. Cl.[5] B23H *7/06*

U.S. Cl. 219—69.12 **2 Claims**



1. A method of positioning a wire electrode, which is fed from a supply source, relative to a workpiece in a wire cut electric discharge machine which comprises the steps of:

stopping under tension said feeding of said wire electrode;

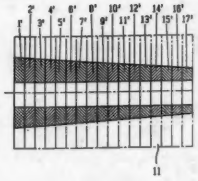
relatively moving said stopped wire electrode and said workpiece with respect to each other; and

suspending said relative movement of said stopped wire electrode and workpiece when said stopped wire electrode and said workpiece are brought into contact with each other to detect a relative position of said wire electrode and said workpiece.

4,985,609
METHOD OF MAKING A BROACH

Franz Hofele, Wagnerstrasse 86, 7322 Donzdorf, Fed. Rep. of Germany

Filed Jun. 2, 1988, Ser. No. 201,526
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, 3720203
Int. Cl.[5] B23P *1/08*
U.S. Cl. 219—69.17 **11 Claims**

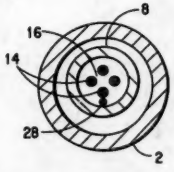


1. A method of making a broach, comprising the steps of:
cutting an plurality of suitably graded cutting elements by means of electric discharge between an electrically conductive wire and metal; and
successively arranging the cutting elements on a support unit wherein the cutting elements are of annular shape and are provided at one circumferential side thereof with radially projecting teeth spaced in circumferential direction and wherein the support unit includes an essentially cylindrical body which coaxially supports the cutting elements at axial distance from each other, with the cutting elements being centered by bearing against a circumferential surface of the cylindrical body with one circumferential surface which opposes the teeth, characterized in that the cutting elements are cut out from a metal plate through wire-EDM, with the surface sections which bound the teeth in radial direction being of tapered shape and the surface sections between the teeth being of cylindrical shape.

4,985,610
CUTTING TORCH

Klaus G. Rucker, Kinnelon, N.J.; Walter J. Simmons, and Larry T. Stilwell, both of Martinsburg, W. Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 199,231, May 26, 1988. This application Aug. 15, 1989, Ser. No. 393,947
Int. Cl.[5] B23K *35/04, 7/00*
U.S. Cl. 219—70 **9 Claims**

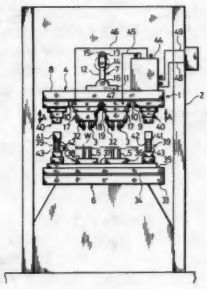


1. A cutting device, comprising:
(a) an elongate external tube means open at least at one end thereof;
(b) ignition means disposed within said external tube means;
(c) a plurality of consumable elements disposed within said external tube means with one end adjacent said ignition means and spaced within said external tube means to define a flow path for a gas generally coaxial with said external tube means and having an exit adjacent said ignition means;
(d) said external tube means including at least one opening for exhausting combustion gases therethrough and disposed about the periphery thereof in relation to the exit of said flow path whereby the flow of said gases exiting said flow path is reversed before they are exhausted; and
(e) means for sealing at least one end of said external means.

4,985,611
WELDING EQUIPMENT

Hajime Iida, and Tadashi Nakamura, both of Koga, Japan, assignors to Takao Kinzoku Kogyo Co., Ltd., Shiga, Japan

Filed Jul. 13, 1988, Ser. No. 218,393
Int. Cl.[5] B23K *11/11, 11/31*
U.S. Cl. 219—87 **17 Claims**



1. A welding equipment comprised of:
a plurality of lower electrode rods erected on mounting blocks of a lower frame of a press,
a crank mechanism provided on an upper frame of the aforementioned press to move said upper frame up-down,
a plurality of upper electrode rods suspended from mounting blocks of the aforementioned upper frame, to hold a work between them and the aforementioned lower electrode rods at the lower most position of said upper frame, and
an electrode reciprocally moving mechanism provided on the aforementioned upper frame, to reciprocally move the aforementioned electrode rods, so that each upper electrode will apply the specified pushing pressure on the aforementioned work at the lower most position of said upper frame.

4,985,612
MASTER COMPUTER CONTROLLED MODULAR WELDER, WELD CONTROL, AND POWER UNIT APPARATUS AND METHOD

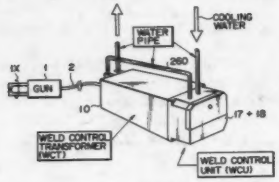
Takatomo Izume, Urawa, Japan, and Michael Lalonde, Detroit, Mich., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 15, 1987, Ser. No. 133,277
Int. Cl.[5] B23K *11/24*
U.S. Cl. 219—116 **47 Claims**

1. A welder apparatus comprising:
a plurality of welder units for performing separate welds; and
master control means, coupled to each of said welder units, for gathering data of the welding condition of each of said welder units, and managing each weld of said welder units in accordance with the gathered welding condition data,
wherein each of said welder units includes:
modular welder means, having a welder transformer provided with welding electrodes, for performing a weld at the welding electrodes by use of a given welding power;
modular control means, coupled to a respective of said

modular welder means, for determining a welding condition of the associated modular welder means; and

modular power means, attached to a respective of said modular welder means and said modular control means, for supplying said welding power to the respective modular welder means and power to said modular control means,



wherein said modular welder means, said modular control means, and said modular power means are modular units with substantially uniform electrical and mechanical connection interfaces, whereby a plurality of the modular control units, welder units, and power units may be used together interchangeably.

4,985,613

LOCKING ARRANGEMENT

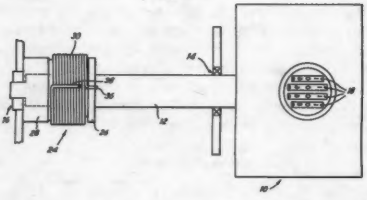
Eric Lytra, Enfield; Peter J. Loeber, Huntingdon, and Barry Simkins, Harlow, all of United Kingdom, assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 26, 1989, Ser. No. 343,978

Claims priority, application United Kingdom, Apr. 27, 1988, 8810012

Int. Cl.[5] G07B *17/00*

U.S. Cl. 235—101 **14 Claims**



1. A locking arrangement for a machine, said machine including a fixed structural member and a rotatable member which rotates when the machine performs an operating cycle and a mechanical or electromechanical register for being incremented or decremented in response to operation of said machine, said locking arrangement comprising clutch means arranged between said fixed structural member and said rotatable member for operatively engaging or releasing said fixed structural member, means associated with said register for actuating said clutch to prevent rotation of the rotatable member relative to the fixed structural member when said register displays a pre-determined value and wherein said clutch means includes a coil spring having two respective end regions, one end region being secured to said rotatable member and the other end region thereof in an unstressed state surrounding with clearance the fixed structural member wherein actuation of said actuator causes said other end region of said coil spring to be stressed to contract onto and engage and fixed structural member.

4,985,614

OBJECT VERIFICATION APPARATUS AND METHOD

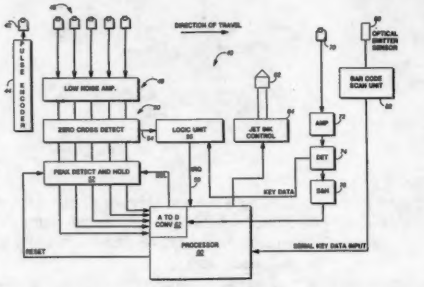
Kevin J. Pease, Glenview; Robert A. Copella, Northbrook, and Ann M. Flannery, Chicago, all of Ill., assignors to Rand McNally & Company, Skokie, Ill.

Continuation of Ser. No. 3,954, Jan. 16, 1987, Pat. No. 4,837,426. This application Jun. 5, 1989, Ser. No. 361,946

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[5] G06K *7/00*

U.S. Cl. 235—440 **35 Claims**



1. A method of verifying the authenticity of an object which has a continuously extending, recordable, magnetic region thereon with the magnetic region including a randomly varying magnetic characteristic unique to the object with detachability of the characteristic enhanced by a selected, prerecorded, discontinuous electrical signal carried by the magnetic region, the method comprising:

detecting the enhanced randomly varying characteristic within the recordable magnetic region;

retrieving a prestored representation of that characteristic;

comparing the enhanced, detected randomly varying characteristic of the recordable magnetic region to the retrieved prestored representation; and

indicating the results of the comparison.

4,985,615

PORTABLE ELECTRONIC APPARATUS HAVING KEY DATA FOR LIMITING MEMORY ACCESS

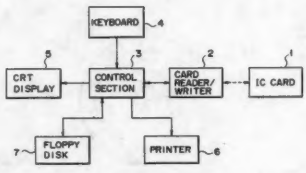
Yasuo Iijima, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 23, 1989, Ser. No. 397,200

Claims priority, application Japan, Aug. 26, 1988, 63-211832

Int. Cl.[5] G06K *19/06*

U.S. Cl. 235—492 **4 Claims**



1. A portable electronic apparatus comprising:

a memory comprising a first region which can be accessed by all of a plurality of applications and second regions which are selectively accessed in accordance with a corresponding one of the applications, the memory storing a plurality of key data;

control means for accessing said memory means and selectively exchanging data with an external device;

means for enabling access to the first region and all of the

second regions by the control means in response to at least one first key data of the plurality of key data; and

means for causing at least one second key data of the plurality of key data to determine an access enable/disable judgement for the first region and a specific region of the second regions, thereby determining said access by the control means.

4,985,616

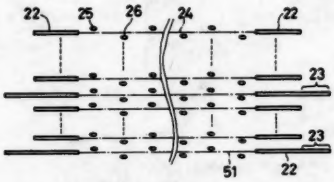
OPTICAL CARD HAVING OPTICAL GROOVES FOR ACCESS AND WOBBLED MARKS FOR TRACKING AND A RECORDING-REPRODUCING APPARATUS THEREFOR

Shigeru Nakamura, Tachikawa; Yoshito Tsunoda, Suginami, and Takeshi Maeda, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,003

Claims priority, application Japan, Feb. 25, 1987, 62-40226

Int. Cl.[5] G11B *7/007*; G06K *7/01*

U.S. Cl. 235—494 **16 Claims**

1. An optical card which enables the optical recording and reproduction of information by the application of laser beams on an information recording surface, and in which said information recording surface has optical reference markers at positions located at a prescribed interval along a prescribed channel and deviated therefrom on the right and left sides alternately at equal distance and has optical reference grooves spaced from one another along a centerline of said channel, said optical reference grooves being disposed in the opposite ends of said channel.

4,985,617

MANUSCRIPT READER

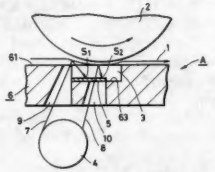
Hiroshi Ogushi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1989, Ser. No. 370,862

Claims priority, application Japan, Jun. 24, 1988, 63-154607

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **13 Claims**



1. A device for reading a passing manuscript, comprising:

a manuscript moving member for performing an endless movement to move the manuscript;

a body comprising a guide member situated at a carrying path of the manuscript, for guiding a movement of the manuscript by said manuscript moving member, said body comprising a single seamless structure;

a manuscript reading member disposed within said body at a position adjacent to said moving member; and

a manuscript detecting member situated within said body to an upstream side of said reading member with respect to a direction of motion of the manuscript.

4,985,618

PARALLEL IMAGE PROCESSING SYSTEM

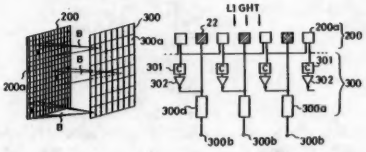
Toshio Inada; Aki Ueda; Hironobu Mifune, and Yukio Ogura, all of Yokohama, Japan, assignors to Nicoh Company, Ltd., Japan

Filed Jun. 13, 1989, Ser. No. 367,756

Claims priority, application Japan, Jun. 16, 1988, 63-148816; Jun. 16, 1988, 63-148817; Jul. 5, 1988, 63-167112

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **12 Claims**



1. A parallel image processing system comprising:

an image detection array comprising a two-dimensional array of a number of photodetector elements for detecting an input image;

edge detection means comprising a number of edge detection elements each being supplied with output signals from a plurality of photodetector elements with respective weights for producing an output signal indicating detection of edge of the input image as a function of a sum of said plurality of output signals applied with said weights; and

movement detection means comprising a number of movement detection elements each being supplied with output signals from a first group of the edge detection elements each in turn corresponding to said plurality of photodetector elements forming a first photodetector group, along a first signal path as an excitement signal, and further from a second group of the edge detection elements each in turn corresponding to said plurality of photodetector elements forming a second photodetector group aligned in row with said first photodetector group in the image detection array, along a second signal path as an inhibitory signal, for producing a movement detection signal indicating movement of the input image on the basis of comparison of the excitement signal and the inhibitory signal.

4,985,619

PHOTOSENSITIVE MATRIX WITH TWO DIODES OF THE SAME BIAS AND ONE CAPACITOR PER PHOTOSENSITIVE DOT

Marc Arques, Grenoble, France, assignor to Thomson-CSF, Puteaux, France

Filed Jul. 26, 1989, Ser. No. 385,086

Claims priority, application France, Jul. 29, 1988, 88 10265

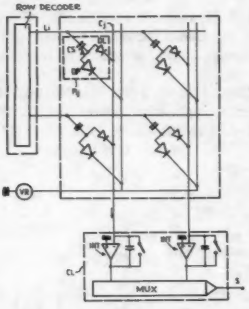
Int. Cl.[5] H04N *3/14*

U.S. Cl. 250—208.1 **5 Claims**

1. A matrix of photosensitive dots comprising:

a network of photosensitive dots arranged in rows of at least one in number and columns at least one in number, each photosensitive dot being located at the intersection of a row and a column, wherein each photosensitive dot comprises two diodes and one capacitor connected to a floating node, the capacitor being connected between a row conductor and the floating node, a first diode, called a

reading diode, being connected between the common floating node and a column conductor to enable the transfer, between this column conductor and the floating node, of a quantity of charges generated on the floating node by the illumination of the photosensitive dot, and a second diode, called a photosensitive diode, being connected



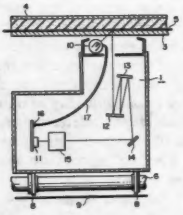
between the floating node and a conductor connected to a source of bias voltage wherein said source of bias voltage is different from the column conductor, to generate, when it is illuminated, electrical charges on the floating node, the diodes having respective electrodes which have a corresponding polarity connected to the floating node.

4,985,620

IMAGE READING APPARATUS

Izumi Takagi, Kuwana, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 28, 1989, Ser. No. 458,316
Claims priority, application Japan, Dec. 28, 1988, 63-33276
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 **9 Claims**



1. An image reading apparatus comprising a light source member for radiating a light which shines a desired original, first convert means for converting the light reflected from the original into an analog signal along a predetermined direction in accordance with an intensity of the reflected light, and second convert means for converting the analog signal converted by said first convert means into a quantized digital signal, said image reading device further comprising:

third convert means for converting the radiated light into a first predetermined signal in accordance with an intensity of the light;

fourth convert means for converting the radiated light into a second predetermined signal along said predetermined direction in accordance with an intensity of the radiated light;

signal generating means for generating a third predetermined signal based upon said first and second predetermined signals; and

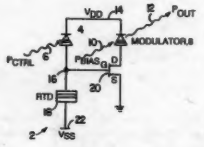
control means for controlling the digital signal converted by said second convert means so as to be varied based upon said third predetermined signal generated by said signal generating means.

4,985,621

ELECTROOPTICAL SWITCH WITH SEPARATE DETECTOR AND MODULATOR MODULES

Brian F. Aull, Cambridge; Kirby B. Nichols, Chelmsford, and T. C. L. Gerhard Sollner, Winchester, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 11, 1989, Ser. No. 336,109
Int. Cl.[5] H01J *31/50*
U.S. Cl. 250—213 A **27 Claims**



17. A two-terminal electrooptical switch which responds to an input beam to produce an output beam, the switch comprising:

a. a modulator for receiving the input beam and producing a photocurrent therefrom, the modulator having a transmissivity which varies as a function of a voltage across the modulator;

b. a nonlinear component connected to receive the current generated by the modulator and produce a corresponding voltage therefrom, the nonlinear component being separate from the modulator and having a region of operation exhibiting negative differential resistance; and

c. an amplifier for amplifying the voltage produced by the nonlinear component and feeding the amplified voltage back to the modulator.

4,985,622

METHOD FOR DETERMINING THE CORROSION RESISTANCE OF DEEP-DRAWABLE IRON SHEETS FOR BODY PARTS OF MOTOR VEHICLES AND APPARATUS FOR PERFORMING THE METHOD

Rudolf Kessler, Reutlingen; Winfried Degen, Esslingen; Dieter Oelkrug, Tubingen, and Martin Tubach, Reutlingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Jun. 12, 1989, Ser. No. 364,607
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1988, 3819900
Int. Cl.[5] G01J *3/50*
U.S. Cl. 250—226 **6 Claims**

1. Method for determining corrosion resistance of a metal sheet comprising the steps of;

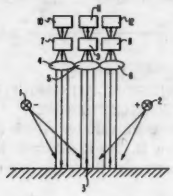
irradiating the iron sheet with radiant energy;

concentrating radiant energy reflected from the iron sheet;

filtering the concentrated radiant energy individually through associated filters each having a filter wavelength;

imaging the filtered radiant energy individually an associ-

ated photoreceivers which each generated individual signals; and



forming ratios of two respective filter wavelengths to determine the corrosion resistance of the metal sheet.

4,985,623

DIFFRACTION-TYPE OPTICAL ENCODER WITH IMPROVED DETECTION SIGNAL INSENSITIVITY TO OPTICAL GRATING GAP VARIATIONS

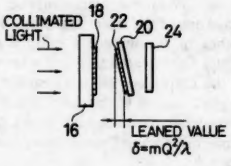
Souji Ichikawa, Sagahihara; Hideki Oka, Kawasaki; Naoyoshi Terao, Urawa, and Seiji Sakagami, Kawasaki, all of Japan, assignors to Mitytoyo Corporation, Tokyo, Japan

Division of Ser. No. 298,430, Jan. 18, 1989, abandoned. This application Mar. 8, 1990, Ser. No. 490,389

Claims priority, application Japan, Jan. 22, 1988, 63-12143; Jan. 25, 1988, 63-42626

Int. Cl.[5] G01D *5/34*

U.S. Cl. 250—231.16 3 Claims



1. An optical encoder comprising:

a coherent collimated lighting system having an effective wave length λ;

a main scale formed with a first grating having a pitch P;

an index scale spaced from the main scale by a grating gap and formed with a second grating having a pitch corresponding to a higher harmonic of 2n order of the first grating, wherein n is a natural number; and

a light receiving element for photoelectrically transducing light emitted from said lighting system and propagated through the first and second gratings so as to produce a detection signal periodically variable in accordance with a relative displacement between the main scale and the index scale;

the index scale being inclined toward the main scale relative to a plane normal to the direction of propagation of light emitted from said lighting system in order to remove a component of fluctuations due to the grating gap from a geometric image of the first grating in the detection signal.

4,985,624

OPTICAL GRATING SENSOR AND METHOD OF MONITORING WITH A MULTI-PERIOD GRATING

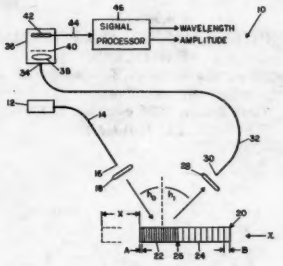
William B. Spillman, Jr., Charlotte, Vt., assignor to Simmonds Precision Products, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 192,716, May 1, 1988. This application Feb. 9, 1989, Ser. No. 308,239

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

Int. Cl.[5] H01J *3/14*

U.S. Cl. 250—237 G 39 Claims



1. A method of optical displacement detection comprising:

providing a diffraction grating having a first grating period and a different second grating period, a first optical fiber and a detecting means having a second optical fiber having input and output ends, means for focusing diffracted light into said input end of said second optical fiber and means coupled to said output end of said second optical fiber for determining at least the wavelength of the diffracted light;

irradiating said diffraction grating at a predetermined angle with broadband optical radiation passing through said first optical fiber; and

detecting a change in a characteristic of the light diffracted from said diffraction grating as a consequence of irradiation of the boundary between the first and second gratings at the boundary is displaced relative to the irradiating light.

4,985,625

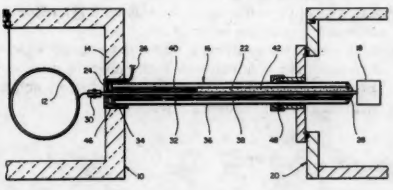
TRANSFER LINE FOR MASS SPECTROMETER APPARATUS

James Hurst, San Jose, Calif., assignor to Finnigan Corporation, San Jose, Calif.

Continuation of Ser. No. 836,809, Mar. 6, 1986. This application Nov. 12, 1987, Ser. No. 120,747

Int. Cl.[5] H01J *49/04*

U.S. Cl. 250—288 11 Claims



1. A mass spectrometer apparatus having a gas chromatograph including a gas column and an ion source comprising:

a transfer line coupled between said gas column and said ion source comprising an assembly of coaxial spaced tubes

including an inner tube through which the effluent or eluant from the gas column is directly passed to the ion source, a middle tube and an outer tube;

a heater unit housed within the and extending along the entire length of said middle tube; and thermally conductive material contained between the entire length of said middle tube and the inner tube to fill all of the unoccupied space between the middle tube and inner tube whereby the inner tube is uniformly heated to pass the effluent or eluant from the gas column to the ion source without changing the chemical structure.

4,985,626

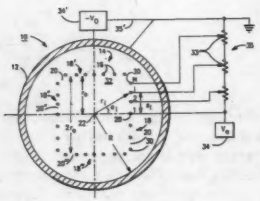
QUADRUPOLE MASS FILTER FOR CHARGED PARTICLES

Marcel Margulies, Scarsdale, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 9, 1990, Ser. No. 462,245

Int. Cl.[5] H01J *49/42*

U.S. Cl. 250—292 **9 Claims**



1. A mass filter for charged particles, comprising:

a cylindrical conductive housing having a longitudinal axis and a radius R, the housing being receptive of a base voltage;

an array of linear conductors arranged in parallel within the housing and divided equally into four subarrays, the conductors of each subarray lying in a plane so that four such planes are in a tubular arrangement with a square cross section centered perpendicular to the longitudinal axis, each plane having a centerline parallel to the conductors, the square cross section having four sides each with a dimension of $2r_o$, the conductors of ech subarray having a substantially uniform distribution and including a primary conductor positioned nearest or on the centerline and further including a pair of terminal conductors bounding all other conductors of the subarray, the terminal conductors being disposed proximate corresponding terminal conductors of adjacent subarrays, and each conductor in each subarray having a position defined by r_i and a_i, where i is an integer designating a conductor from i=1 for the primary conductor to i=N for each terminal conductor with N being the number of conductors in each half subarray, r_i is radial distance from the axis, and a_i is an angle with a positive value about the axis with reference to the centerline having an angle of zero; and

voltage means for applying a dedicated voltage V_i to each corresponding conductor in each subarray relative to a voltage V_1 applied to the primary conductor, nominally according to the following equations:

$$\sum_{i=2}^{N} (V_i/V_1)\{(r_o/r_i)^{2(2k+1)} - (r_o r_1/R^2)^{2(2k+1)}\}\cos[2(2k+1)a_i] = -\{(r_o/r_1)^{2(2k+1)} - (r_o r_1/R^2)^{2(2k+1)}\}\cos[2(2k+1)a_1] \quad (k = 1, 2 \ldots N-1)$$

where the voltages for each subarray are the negative of the voltages for adjacent subarrays and are relative to the base voltage being taken as zero;

whereby the mass filter provides an electric field profile generally characteristic of a quadrupole filter.

4,985,627

SPIN-POLARIZED SCANNING TUNNELING MICROSCOPE

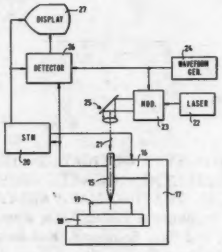
Santos F. A. Gutierrez, Rüschlikon; Alexis Baratoff, Schönenberg, and Wolfgang D. Pohl, Adliswil, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 10, 1989, Ser. No. 391,908

Claims priority, application European Pat. Off., Aug. 18, 1988, 88810570.7

Int. Cl.[5] H01J *37/26*

U.S. Cl. 250—306 **7 Claims**



1. A spin-polarized scanning tunneling microscope comprising: a tunnel tip disposed opposite a surface of a sample to be investigated separated by a gap having a width of between 0.1 and 10 nm, an xyz-drive for positioning said tunnel tip at the gap and for causing said tunnel tip to be raster-scanned across said surface, and electronic circuitry for maintaining the width of the gap essentially constant, characterized in that said tunnel tip, and the sample to be investigated comprise, at least in part, different materials, one of the materials being a magnetic material, and the other of the materials being a semiconductor material, and that a light source transmit a beam of circularly polarized light, the light beam being caused to impinge upon the surface at a point closest to the apex of said tunnel tip and the light beam traveling through said tunnel tip of traveling through the sample of impinging upon the surface at an oblique angle of incidence.

4,985,628

INSPECTION APPARATUS INCORPORATING DIGITAL ELECTRON DETECTION

Robert E. Horstman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1988, Ser. No. 277,572

Claims priority, application Netherlands, Dec. 1, 1987, 8702874

Int. Cl.[5] G01N *23/00*

U.S. Cl. 250—310 **15 Claims**

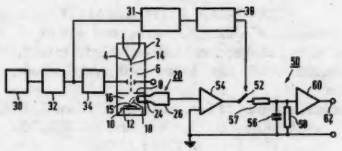
1. A beam inspection apparatus comprising:

an electron beam radiation source,

a measuring space for positioning an object to be examined via an electron beam from said radiation source, said object being an integrated semiconductor circuit chip arranged in the measuring space so as to receive the electron beam,

a beam control system for said electron beam,

a detection device arranged to detect electrons emerging from the object due to interaction between the beam and



the object, said detection device comprising electronic devices for counting individual electrons, and

an exposure beam interruptor for pulsed measurements.

4,985,629

SHADING ELMINATION METHOD FOR AN IMAGE READ-OUT APPARATUS

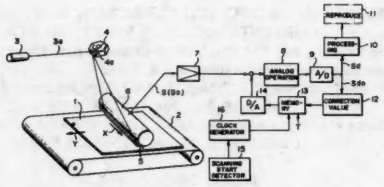
Kazuo Horikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 10, 1989, Ser. No. 391,830

Claims priority, application Japan, Aug. 24, 1988, 63-210067

Int. Cl.[5] G01N *23/04*

U.S. Cl. 250—327.2 **5 Claims**



1. A shading elimination method for an image read-out apparatus wherein a light beam is reflected and deflected by a rotating polygon mirror which has a plurality of reflecting surfaces, a surface which has an image recorded thereon is two-dimensionally scanned with the deflected light beam, and light which is emitted by the scanned surface and which carries information about the image is detected and converted into an image signal by a photoelectric read-out means,

the shading elimination method comprising the steps of:

(i) storing shading characteristics of each of a plurality of picture element columns for each of the respective reflecting surfaces of said rotating polygon mirror in a storage means, and

(ii) eliminating fluctuations in said image signal, which are caused by the shading, with respect to the respective reflecting surfaces of said rotating polygon mirror on the basis of the stored shading characteristics which correspond to the respective reflecting surfaces.

4,985,630

RADIATION IMAGE READ-OUT APPARATUS AND REPRODUCTION CONDITION DESIGNATING APPARATUS

Nobuaki Higaki; Masamitsu Ishida, and Nobuyoshi Nakajima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

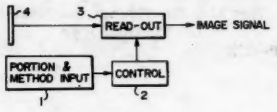
Continuation of Ser. No. 774,428, Sep. 10, 1985, abandoned. This application Mar. 18, 1988, Ser. No. 171,242

Claims priority, application Japan, Sep. 12, 1984, 59-192096; Sep. 13, 1984, 59-191326

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[5] G01N *23/04*

U.S. Cl. 250—327.2 **8 Claims**



1. A radiation image read-out apparatus comprising:

read-out means for detecting a radiation image recorded on a recording medium and generating an electric image signal,

input means for entering information concerning an image recording portion of an object and an image recording method, and

control means for selecting read-out conditions which are derived in a predetermined manner for various portions of said object and for a plurality of image recording methods on the basis of the information entered by said input means, and for feeding the selected read-out conditions to said read-out means.

4,985,631

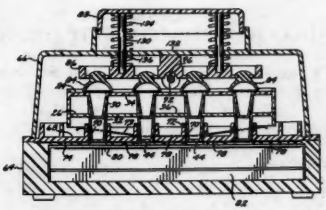
LUMINESCENCE EXPOSURE APPARATUS

Jon C. Wannlund, 5850 Despejo Pl., San Diego, Calif. 92124, and Jerry W. Smith, 2540 E. Delhi Rd., Ann Arbor, Mich. 48103

Continuation-in-part of Ser. No. 155,955, Feb. 16, 1988. This application Feb. 13, 1989, Ser. No. 308,718

Int. Cl.[5] G01N *21/76*

U.S. Cl. 250—361 R **13 Claims**



1. Luminescence exposure apparatus for conducting luminescence reaction tests on specimens contained within a test well in a reaction test apparatus, comprising:

a lower housing having

a flat, upwardly facing internal surface comprising means for receiving a piece of film thereupon.

a mask covering the upwardly facing surface and having an opening therethrough positioned to correspond to the location of the test well in the reaction test apparatus,

biasing means on the mask for resisting the downward

movement of the reaction test apparatus, when the reaction test apparatus is placed upon the mask, and

a movable shutter between the upwardly facing internal surface and the mask; and

an upper housing including

translation means for controllably urging the reaction test apparatus downwardly against the resistance of the biasing means, thereby contacting the bottom of the reaction well in the reaction test apparatus with the piece of film in the lower housing.

4,985,632

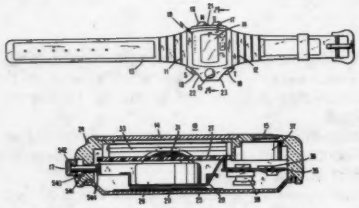
SUNTAN INDICATOR

Frank J. Bianco, Pembroke Pines; Charles W. Owen, and Elie Talamas, Jr., both of Miami, all of Fla., assignors to Elexis Corporation, Miami, Fla.

Filed May 31, 1989, Ser. No. 359,680

Int. Cl.[5] G01J *1/42*

U.S. Cl. 250—372 17 Claims



1. Apparatus for indicating the amount of time skin of a subject can be safely exposed to skin damaging ultraviolet radiation comprising a detector for said radiation, means for deriving indications of subject skin type and sun protection factor on the subject skin, computer means responsive to said indications and an instantaneous value of said radiation incident on said detector for initially calculating the length of time the subject skin can be safely exposed to the radiation at a detected instantaneous value thereof, means responsive to said instantaneous detected value and independent of radiation accumulated on said detector for indicating when the length of time the subject skin can be safely exposed has expired, the indicating means being activated independently of accumulated radiation incident on the detector.

4,985,633

SCINTILLATOR WITH ALVEOLATE STRUCTURED SUBSTRATE

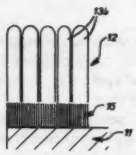
Gérard Vieux, Grenoble, and Paul de Croot, St. Ismier, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Jul. 19, 1989, Ser. No. 381,862

Claims priority, application France, Jul. 22, 1988, 88 09938

Int. Cl.[5] G01T *1/20*

U.S. Cl. 250—486.1 4 Claims



1. A scintillator comprising a substrate on which there is deposited a scintillating material in the form of thin, appreciably parallel needles, wherein the face of said substrate having said scintillating material has an alveolate surface state or comprises an alveolate structure.

4,985,634

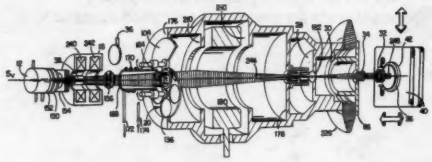
ION BEAM LITHOGRAPHY

Gerhard Stengl, Wernberg, Austria, and Hilton F. Glavish, Salem, Mass., assignors to Oesterreichische Investitionskredit Aktiengesellschaft and Ionen Mikrofabrications, Vienna, Austria

Continuation-in-part of Ser. No. 201,959, Jun. 2, 1988. This application Jul. 29, 1988, Ser. No. 226,275

Int. Cl.[5] H01J *37/30*

U.S. Cl. 250—492.2 51 Claims



1. An ion projection lithography apparatus comprising:

means to provide an ion beam,

a mask in the path of said ion beam with apertures for producing a desired beam pattern,

an optical column after said mask,

said column defined by first and second principal lenses located along said ion path,

said first lens being an accelerating Einzel lens arranged to form a crossover within said column,

said second lens positioned after said crossover and being a gap lens, arranged to project a reduced image of said mask and

a target station after said gap lens for supporting a target that receives said image.

4,985,635

METHOD OF PRODUCING EXTRA-LOW IRON LOSS GRAIN ORIENTED SILICON STEEL SHEETS

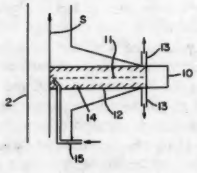
Yukio Inokuti, and Yoh Ito, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. No. 95,527, Sep. 10, 1987. This application Nov. 30, 1989, Ser. No. 444,050

Claims priority, application Japan, Sep. 16, 1986, 61-215835; Oct. 11, 1986, 61-240189; Jan. 28, 1987, 62-16123; Feb. 10, 1987, 62-27386

Int. Cl.[5] H01F *1/04*

U.S. Cl. 250—492.300 2 Claims



1. An apparatus for continuously reducing iron loss in a moving grain oriented silicon steel sheet, comprising means for forming an insulation coating compound composed mainly of a phosphate and colloidal silaca on the grain oriented silicon steel, a vacuum treating unit provided with a sheet entrance and exit and an electron beam irradiation device for irradiating

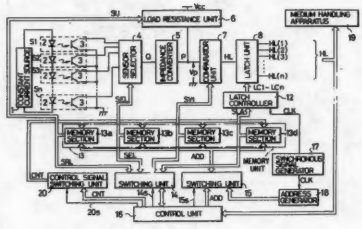
an electron beam to the silicon steel sheet in a direction crossing the direction of movement of the sheet, means for applying an inert gas into the vicinity of the electron beam irradiated zone and a pair of exhaust unit rows arranged at the entrance and exit of said treating unit and adjusted to gradually increase the degree of vacuum as the sheet moves toward said treating unit.

4,985,636

MEDIUM DETECTING SYSTEM WITH AUTOMATIC COMPENSATION FOR SENSOR VARIATIONS

Tsutomu Fukui; Hideto Koike, and Kemmi Ayukai, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 399,931
Claims priority, application Japan, Sep. 2, 1988, 63-220234; Aug. 24, 1989, 1-218075; Aug. 24, 1989, 1-98745
Int. Cl.[5] G01N *21/86*; G06K *9/00*
U.S. Cl. 250—559 **13 Claims**



1. A medium detecting system, comprising:

a plurality of optical sensors, each including a light-emitting element and a light-receiving element disposed to confront each other so that a medium interposed between the light-emitting element and the light-receiving element interrupts the light transmitted from the light-emitting element to the light-receiving element, the electric current flowing through the light-receiving element varying with the amount of light received by it;

a load resistance unit means, provided in common for the plurality of sensors, for varying the load resistance responsive to load resistance selecting data;

a sensor selector means, responsive to sensor selecting data, for selecting one of the sensors and connecting the light-receiving element of the selected sensor to the load resistance unit means; and

a rewritable memory unit means for storing the sensor selecting data and load resistance setting data for the respective sensors, said load resistance setting data being supplied as said load resistance selecing data to the load resistance unit means.

4,985,637

SUPPORT BEARING FOR COAXIAL STARTER

Shuzoo Isozumi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,740
Claims priority, application Japan, Jun. 8, 1988, 63-75924
Int. Cl.[5] F02N *11/02*
U.S. Cl. 290—48 **4 Claims**

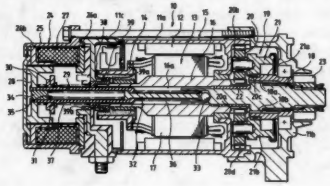
1. A coaxial starter comprising:

an electric motor having a wall and an armature shaft which is a tubular shaft defining an axial direction;

an output rotary shaft slidable in said axial direction and having an end portion extending at one end of said motor so that the torque of said armature shaft is transmitted to said output rotary shaft through a driving power transmission means;

a pinion provided on said output rotary shaft at said end portion thereof;

an electromagnetic switch provided at the other end of said motor adjacent said wall and having an actuation rod extending into the internal opening of said armature shaft through an opening of said wall of said motor so that said



rod is moved in said axial direction at the time of electric energizing of said switch so as to slide said output rotary shaft in said axial direction; and

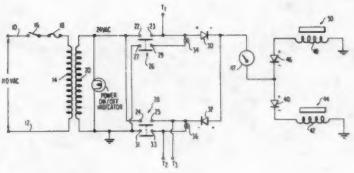
bearing means for supporting both rotation of said armature shaft and axial movement of said rod, said bearing means being fitted in said opening of said wall.

4,985,638

VALVE CONTROL CIRCUIT FOR IRRIGATION SYSTEM

James R. Brock, 1401 N. Rhodes St., No. 405, Arlington, Va. 22209

Filed Mar. 31, 1988, Ser. No. 176,185
Int. Cl.[5] H01H *47/14*
U.S. Cl. 307—38 **3 Claims**



1. In an irrigation system comprised of at least a first solenoid actuated sprinkler positioned to water a first location, a water transporting conduit connecting a source of water to said first solenoid actuated sprinkler, and a single conductive pathway electrically connecting said first solenoid actuated sprinkler to a source of alternating current at a central location remote from said first location, the improvement comprising an add on package for adding a second solenoid actuated sprinkler to the irrigation system at a second location remote from the central location without having to trench electrical wiring from the central location out to said second location, said add on package comprising:

said second solenoid actuated sprinkler connected to said single conductive pathway, said second solenoid actuated sprinkler to be positioned at said second location remote from aid central location;

a first diode connected between said single conductive pathway and said first solenoid actuated sprinkler;

a second diode connected between said single conductive pathway and said second solenoid actuated sprinkler, said first and second diodes being oppositely poled;

a pair of switches connected to said single conductive pathway at said central location so as to selectively supply alternating current from said source of alternating current to said first and second solenoid actuated sprinklers through said single conductive pathway; and

third and fourth diodes connected to said single conductive pathway in an antiparallel relationship across said pair of

switches, whereby said add on package permits selective operation of said first and second sprinklers by actuation of said pair of switches where either

(i) no current is supplied to either said first or said second solenoid actuated sprinklers, thereby preventing watering at either said first or said second remote locations,

(ii) current is supplied only to said first solenoid actuated sprinkler on positive half cycles, thereby watering at only said first remote location,

(iii) current is supplied only to said second solenoid actuated sprinkler on negative half cycles, thereby watering at only said second remote location, and

(iv) current is supplied to said first solenoid actuated sprinkler on positive half cycles and current is supplied to said second solenoid actuated sprinkler on negative half cycles, thereby watering both said first and second remote locations.

4,985,639

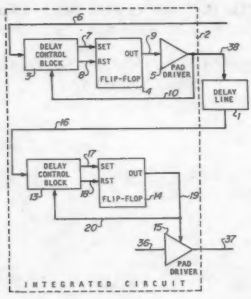
LOGIC EDGE TIMING GENERATION

Denny M. Renfrow, San Jose; Francis X. Schumacher, Palo Alto, and Edward R. Helder, Fremont, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 7, 1989, Ser. No. 376,783

Int. Cl.[5] H03K *5/00, 5/13*

U.S. Cl. 307—262 **19 Claims**



1. An edge generation circuit which phase delays pulses of a first signal propagated on an integrated circuit, the edge generation circuit comprising:

a first variable delay circuit on the integrated circuit, the first variable delay circuit receiving the first signal and producing a second signal, the second signal being in phase with the first signal;

a delay line located off the integrated circuit, the delay line receiving the second signal and delaying the second signal to produce a third signal; and,

a second variable delay circuit on the integrated circuit, the second variable delay circuit receiving the third signal and producing a fourth signal, the fourth signal being in phase with the third signal.

4,985,640

APPARATUS FOR GENERATING COMPUTER CLOCK PULSES

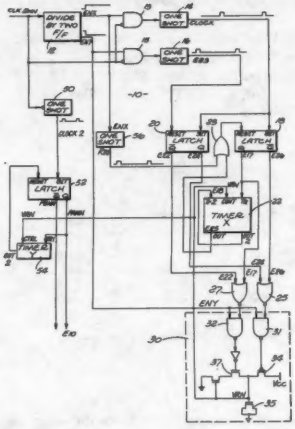
Edward Grochowski, San Jose, and Rajesh Gupta, Sunnyvale, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Apr. 4, 1990, Ser. No. 472,598

Int. Cl.[5] H03K *5/13, 3/017*

U.S. Cl. 307—269 **16 Claims**

1. A circuit for generating a pair of clock pulses of opposite phases each having the same frequency as the frequency of an input signal generated by a crystal oscillator comprising means for generating a first pair of signals of opposite phases at half the frequency of the input signal generated by a crystal oscillator, means for generating a second pair of signals of opposite phases at half the frequency of the input signal generated by a crystal oscillator, means for comparing a first one of the first pair of signals with the one of the signals of the second pair of signals which is normally out of phase therewith to produce an output signal only when the two signals are in phase, means for comparing a second one of the first pair of signals with the one of the signals of the second pair of signals which is normally out or phase therewith to produce an output signal only when the two signals are in phase, means utilizing one of the output signals to lengthen the duty cycle of one of the first pair of



signals of opposite phases and the other of the output signals to shorten the duty cycle of the other of the first pair of signals of opposite phases, means for producing a pair of clock pulses of opposite phases each having the same frequency as the frequency of an input signal generated by a crystal oscillator, and means responsive to the means utilizing one of the output signals to lengthen the duty cycle of one of the first pair of signals of opposite phases and the other of the output signals to shorten the duty cycle of the other of the first pair of signals of opposite phases for varying the duty cycle of the pair of clock pulses of opposite phases each having the same frequency as the frequency of an input signal generated by a crystal oscillator.

4,985,641

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING SELECTABLE OPERATIONAL FUNCTIONS

Yasuji Nagayama, Hirayama; Kazutoshi, and Atsushi Ozaki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1989, Ser. No. 315,084

Claims priority, application Japan, May 7, 1988, 63-110814

Int. Cl.[5] H03K *17/22, 17/284, 5/153, 17/687*

U.S. Cl. 307—272.3 **14 Claims**

1. A semiconductor integrated circuit device having operational functions, selection of a particular function being determined by the absence or presence of a wiring connection between a first bonding pad (20) and a power supply having a first predetermined potential, comprising:

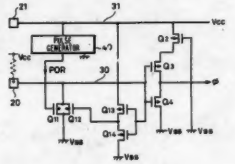
a first potential supply line (31) for supplying an operating potential (Vcc),

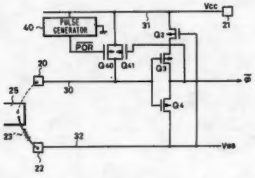
means (Q2, Q3, Q4) for generating a signal for designating one of said operational functions in response to a potential on an input signal line (30) connected to said first bonding pad (20),

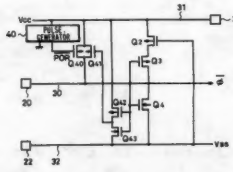
means (40) for generating aone shot pulse signal for a prede-

termined period in response to energizing of said first potential supply line by said power supply,

means (Q11, Q40, Q52) momentarily activated in response to an output of said one shot pulse signal generating means, for resetting said input signal line to a second predetermined potential, and







means (Q12, Q13, Q14; Q3, Q4, Q12; Q30, Q31, Q32; Q3, Q4, Q41; Q41, Q42, Q43; Q50, Q51, Q52) for setting and maintaining a potential on said input signal line in response to said potential on said input signal line, and cutting off a current path formed by said input signal line, said first bonding pad and said power supply when said bonding pad is connected to said power supply.

4,985,642

HIGH-FREQUENCY CIRCUIT HAVING A LOADED FIELD-EFFECT TRANSISTOR

Patrice Gamand, Yerres, France, assignor to U.S. Philips Corp., New York, N.Y.

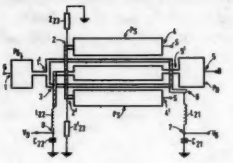
Filed Dec. 14, 1988, Ser. No. 284,205

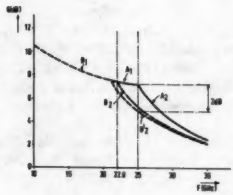
Claims priority, application France, Dec. 18, 1987, 87 17712

Int. Cl.[5] H03K *3/353;* **H03B** *5/18;* **H01L** *29/80*

U.S. Cl. 307—304 **9 Claims**

1. A high-frequency circuit comprising at least a field-effect transistor having an active zone, gate, drain and source electrodes in contact with said active zone, the gate electrode receiving a high-frequency input signal in operation, the source and drain electrodes being provided with biasing and charging circuits, and the source electrode being connected to ground through a load, characterized in that high-frequency signals are present at a first end of said electrodes in operation,





said electrodes being terminated at their second end by at least one of a biasing circuit and a charging circuit.

4,985,643

SPEED ENHANCEMENT TECHNIQUE FOR CMOS CIRCUITS

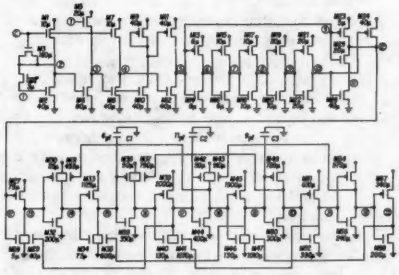
Robert J. Proebsting, Los Altos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

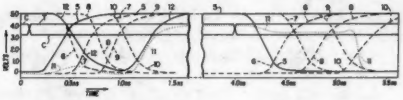
Continuation of Ser. No. 210,969, Jun. 24, 1988, abandoned.

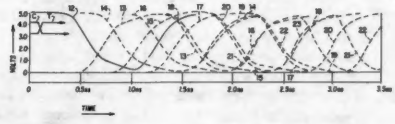
This application Apr. 24, 1990, Ser. No. 515,769

Int. Cl.[5] H03K *19/003, 19/017, 17/04, 17/687*

U.S. Cl. 307—443 **29 Claims**







1. A circuit comprising:

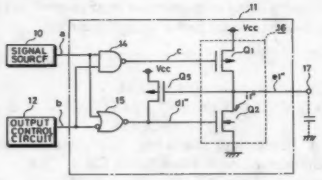
a plurality of cascaded stages, each stage capable of being placed in one of a first logic state or a second logic state, wherein the first logic state of at least one selected stage is controlled by at least one stage immediately preceding the selected stage, while the second logic state is primarily controlled by at least one stage following the selected stage.

4,985,644

OUTPUT BUFFER SEMICONDUCTOR AND METHOD FOR CONTROLLING CURRENT FLOW IN AN OUTPUT SWITCHING DEVICE

Yoshihiko Okihara, and Yutaka Arita, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1988, Ser. No. 274,438
Claims priority, application Japan, Nov. 26, 1987, 62-300556
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—443 **14 Claims**



4. An output buffer circuit for a semiconductor device, comprising:

output driving means responsive to first and second logical signals supplied from said semiconductor device for supplying an output signal of either a first level of a high potential or a second level of a low potential,

said output driving means comprising

(a) a first voltage source of said first level,

(b) a second voltage source of said second level,

(c) an output terminal for supplying said output signal,

(d) a first semiconductor switching device of a first conductivity type having a conductive path connected between said first voltage source and said output terminal and a control terminal receiving said first logical signal, and

(e) a second semiconductor switching device of a second conductivity type having a conductive path connected between said second voltage source and said output terminal and a control terminal receiving said second logical signal, and

means responsive to the level of the output signal in said output terminal for controlling current flowing through the conductive path in said second semiconductor switching device, wherein

said current control means comprises means for controlling said second logical signal applied to the control terminal of said second switching device when the level of the output signal at said output terminal is switched from said first level to said second level, and

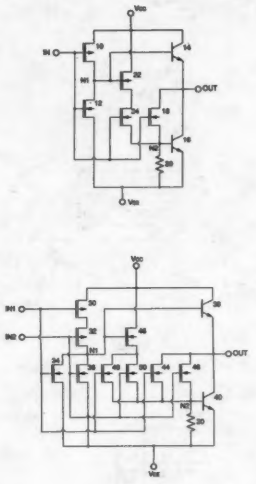
said means for controlling said second logical signal comprises a third semiconductor switching device of the first conductivity type having a conductive path connected between the control terminal of said second semiconductor switching device and said first voltage source and a control terminal connected to said output terminal.

4,985,645

BICMOS LOGIC CIRCUIT HAVING A RAPID OUTPUT VOLTAGE FALLING-DOWN PROPERTY

Hiroaki Tsutsui, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 26, 1989, Ser. No. 412,814
Claims priority, application Japan, Sep. 26, 1988, 63-240176
Int. Cl.[5] H03K *19/017, 17/04, 19/092, 17/12*
U.S. Cl. 307—446 **10 Claims**



1. A BiCMOS logic circuit which includes an input terminal, an output terminal, a MOS logic circuit connected between a first voltage supply line and a second voltage supply line and having an input connected to the input terminal, and an output circuit composed of first and second bipolar transistors connected in series between the first voltage supply line and the second voltage supply line, the first bipolar transistor having a base connected to an output of the MOS logic circuit, a connection node of the first and second bipolar transistors being connected to the output terminal, comprising a base current supplying circuit having first and second MOS transistors connected in series between said first voltage supply line and a base of said second bipolar transistor, said first MOS transistor having a gate connected to said output of said MOS logic circuit, said second MOS transistor having a gate connected to said input terminal.

4,985,646

OUTPUT BUFFER CIRCUIT OF SEMICONDUCTOR INTEGRATED CIRCUIT

Shigeru Kumagai, Kawasaki; Hiroshi Iwahashi, Yokohama, and Hiroto Nakai, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 11, 1989, Ser. No. 378,973
Claims priority, application Japan, Jul. 11, 1988, 63-172321
Int. Cl.[5] H03K *19/017, 5/12, 5/159*
U.S. Cl. 307—448 **21 Claims**

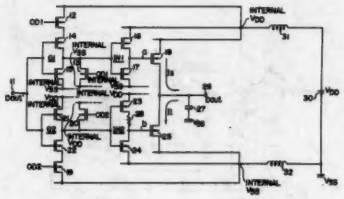
1. An output buffer for producing an output data at an output terminal in response to an input signal comprising:

a first MOS transistor for charging said output terminal toward a first supply potential when said input signal changes to a first logic level, including a source and drain connected between said output terminal and a first supply potential terminal, and a gate;

a first control means, coupled to the input signal and to the gate of the first MOS transistor, for controlling a potential of the gate of the first MOS transistor;

a second MOS transistor for discharging said output terminal toward a second supply potential when said input signal changes to a second logic level, including a source and drain connected between said output terminal and a second supply potential terminal, and a gate substantially isolated from the second supply potential during the time the input signal is at the second logic level; and

a second control means, coupled to the input signal and to the gate of the second MOS transistor, for controlling a potential of the gate of the second MOS transistor by



charging said gate of the second MOS transistor toward a first supply potential, including resistance means having one end connected to the gate of said second MOS transistor and having a substantially constant resistance value, and a third MOS transistor having a drain coupled to the other end of the resistance means, a source coupled to the first supply potential terminal, and a gate coupled to the input signal;

wherein during the time when the input signal is at the second logic level the gate of the second transistor is sufficiently isolated from the second supply potential whereby a decreasing current flowing through the resistance means charges the gate at a gradually decreasing rate.

4,985,647

CMOS TRANSFER SWITCH FREE FROM MALFUNCTION ON NOISE SIGNAL

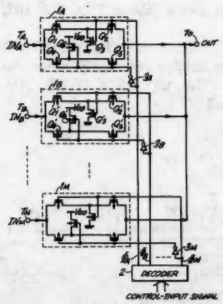
Shigeru Kawada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 21, 1989, Ser. No. 369,532

Claims priority, application Japan, Jun. 21, 1988, 63-154419

Int. Cl.[5] H03K *19/94, 17/687*

U.S. Cl. 307—449 **10 Claims**



1. An analog switch circuit comprising a control signal generator producing a control signal and an inverted control signal formed by inverting said control signal; and input terminal receiving an input signal; an output terminal; first and second transistors of one conductivity type having gate electrodes and forming a first series-connection connected between said input terminal and said output terminal to turn on/off in response to said control signal mutually applied to said gate electrodes, thereby controlling a transfer of said input signal between said input and output terminals; a third transistor connected between an interconnection node of said first and second transistors and one of a ground potential terminal and a power supply potential terminal and having a gate electrode receiving said control signal to perform an on/off operation which is opposite to the on/off operation of said first and second transistors in response to said control signal; fourth and fifth transistors of the conductivity type opposite to said one conductivity type and having gate electrodes and forming a second series connection connected between said input and output terminals to turn on/off in response to said inverted control signal, said inverted control signal being mutually applied to the gate electrodes of said fourth and fifth transistors, thereby controlling a transfer of said input signal between said input and output terminals in synchronism with said first and second transistors; and a sixth transistor connected between an interconnection node of said fourth and fifth transistors and another of said ground potential terminal and said power supply potential terminal to perform an on/off operation which is opposite to the on/of operation of said fourth and fifth transistors in response to said control signal.

4,985,648

SWITCHING OUTPUT CIRCUIT WITH HIGH SPEED OPERATION AND LOW POWER CONSUMPTION

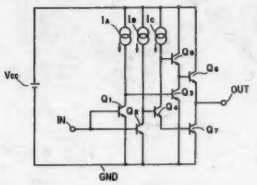
Toshiaki Tsuruoka; Masafumi Nakamura, both of Tsu, and Shintaro Mori, Itami, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 18, 1989, Ser. No. 386,356

Claims priority, application Japan, Jul. 26, 1988, 63-187692; May 19, 1989, 1-127155

Int. Cl.[5] H03K *19/088*

U.S. Cl. 307—456 **9 Claims**



1. A switching output circuit comprising:

first and second power supply lines one of which supplies a relatively high potential and the other of which supplies a relatively low potential;

first, second and third current supply means connected to said first power supply line;

an input terminal;

a first transistor having a base connected to said input terminal, an emitter connected to said second power supply line and a collector connected to said first current supply means;

a second transistor having a base connected to said input terminal, an emitter connected to said second power supply line and a collector connected to said second current supply means;

a third transistor having a base connected to said collector of said first transistor and an emitter connected to said second power supply line;

a fourth transistor having a base connected to said collector of said second transistor and a collector connected to said third current supply means;

a fifth transistor having a base connected to said collector of

said fourth transistor, an emitter connected to a collector of said third transistor and a collector connected to said first power supply line;

a sixth transistor having a base connected to said emitter of said fifth transistor and a collector connected to said first power supply line;

a seventh transistor having a base connected to an emitter Of said fourth transistor and an emitter connected to said second power supply line; and

an output terminal commonly connected to an emitter of said sixth transistor and a collector of said seventh transistor.

4,985,649

CONNECTION NETWORK FOR THE ADJUSTABLE CONNECTION OF A PLA

Dieter Schuett, and Winfried Glaeser, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

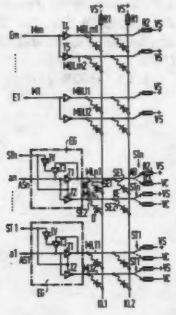
PCT No. PCT/DE88/00273, § 371 Date Sep. 12, 1989, § 102(e) Date Sep. 12, 1989, PCT Pub. No. WO88/09997, PCT Pub. Date Dec. 15, 1988

PCT Filed May 5, 1988, Ser. No. 423,446

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718916

Int. Cl.[5] H03K *19/177*

U.S. Cl. 307—465 **14 Claims**



1. Connection network for the adjustable connection of circuit elements, particularly programmable circuit elements, whereby every circuit element can be a transmitter or receiver, comprising:

a matrix composed of a connection matrix and of an adjustment matrix;

the connection matrix composed of bidirectionally operable data lines and of coupling lines crossing therewith and having programmable switching elements respectively connected between the data lines and the coupling lines at the crossing locations of the data lines and coupling lines;

data terminals of the data line connected to terminals of the circuit elements;

the adjustment matrix composed of the coupling lines and of adjustment lines crossing therewith and having programmable switching elements respectively connected between the coupling lines and adjustment lines at the crossing locations of the coupling lines and adjustment lines;

data terminals being connected to one another within the connection matrix by applying an adjustment code to the adjustment lines of the adjustment matrix.

4,985,650

PROGRAMMABLE LOGIC CIRCUIT HAVING BIDIRECTIONAL DATA LINES

Dieter Schlett, and Winfried Glaeser, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

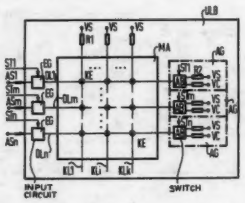
PCT No. PCT/DE88/00272, § 371 Date Sep. 6, 1989, § 102(e) Date Sep. 6, 1989, PCT Pub. No. WO88/09996, PCT Pub. Date Dec. 15, 1988

PCT Filed May 5, 1988, Ser. No. 415,255

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3718915

Int. Cl.[5] H03K *19/177*

U.S. Cl. 307—465 **11 Claims**



1. Programmable circuit arrangement for logically processing binary input signals upon employment of a matrix that is composed of data lines, of coupling lines crossing therewith and of switching elements arranged at the coupling locations of the data lines and coupling lines, comprising:

every data line being an input or output dependent on a control signal on a control line operatively connected to the data line;

every switching element being programmable and having three possible statuses;

every coupling line terminated by associated first means for terminating such that input signals coupled from the data lines, operated as input lines, onto the coupling line are subjected to an AND operation;

every data line terminated by associated second means for terminating such that, given operation as an output line, coupling signals coupled in from the coupling lines are subjected to an OR operation.

4,985,651

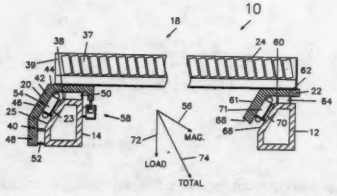
LINEAR MOTOR WITH MAGNETIC BEARING PRELOAD

Anwar Chitayat, Duck Island, P.O. Box 107, Northport, N.Y. 11768

Division of Ser. No. 109,987, Oct. 19, 1987, Pat. No. 4,857,367. This application Jan. 9, 1989, Ser. No. 294,215

Int. Cl.[5] H02K *41/00, 7/08*

U.S. Cl. 310—12 **11 Claims**



1. A linear motor comprising:

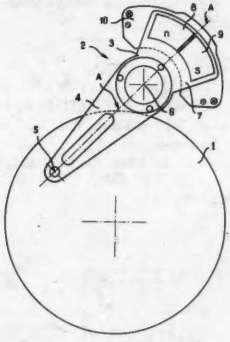
a rail;

a plurality of permanent magnets disposed on a surface of said rail;
a movable member;
said movable member including an armature containing magnetically attractable material;
bearing means for supporting said movable member in a position spacing a surface of said armature to a surface of said plurality of permanent magnets;
said bearing means including an air bearing;
said rail including a surface facing said air bearing;
said air bearing being effective in normal operation for supporting said movable member with a spacing D1 between said air bearing and said surface;
said bearing means including at least one auxiliary bearing;
said auxiliary bearing including means for preventing said air bearing from approaching closer than a distance D2 between said air bearing and said surface;
distance D2 is less than D1; and
distance D2 is greater than zero.

4,985,652
SINGLE-PHASED ANGULAR ELECTROMAGNETIC ACTUATOR

Claude Oudet, Besancon, and Daniel Prudham, Thise, both of France, assignors to Moving Magnet Technologies S.A., Besancon, France

Filed Jan. 3, 1990, Ser. No. 460,548
Claims priority, application France, Nov. 6, 1989, 89 14507
Int. Cl.[5] H02K *33/16*; G11B *5/55, 21/08*
U.S. Cl. 310—15 **13 Claims**



1. An angular single-phased electromagnetic actuator comprising:
a stator structure having two stator parts provided opposite each side of a thin magnetized portion of an angularly movable member, each of said stator parts made of a material having a very high magnetic permeability, at least one of the stator parts having 2N+1 magnetic poles where N is an integer, at least one of said magnetic, poles being energized by an electrical coil, a finite portion, being formed with 2N pairs of alternate poles, transversely magnetized, the thin magnetized portion having over its working range a substantially linear demagnetization characteristic;
wherein the two stator parts are connected exclusively by one or more non-magnetic spacers defining an air gap in which is fitted the thin magnetized portion of the movable member; and
wherein the following relationship holds,

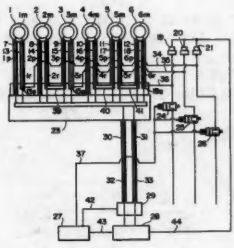
$$S_{fer} \geq \frac{B_a}{B_{fer}} \times S_a$$

where,
S_{fer} is the section of one of the stator parts as measured in any radial plane defined by the radius passing between the two thin magnetized portions and a rotation axis of the movable member,
S_a is the surface area of one of the 2N pairs of the poles as measured in the plane normal to the magnetization,
B_{fer} is the induction in the stator,
B_a is the induction in the magnet, and
the movable member clearance is limited so as to prohibit the displacement of the magnetized portion beyond an area wherein a release force becomes decreasing.

4,985,653
INTERNAL PRESSURE EXPLOSION-PROOF CONSTRUCTION FOR ELECTRICALLY-DRIVEN ROBOT

Noboru Takagi, and Mitsuyoshi Obata, both of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 20, 1989, Ser. No. 382,188
Int. Cl.[5] H02K *9/28*; B25J *3/00*
U.S. Cl. 310—88 **6 Claims**



1. In an internal pressure explosion-proof construction for an electrically-driven robot of the type wherein an electric driving motor is installed in each of a plurality of airtight chambers into which air or inert gas is charged when said electrically-driven robot is to be rendered operative, the improvement comprising said airtight chambers being grouped into a plurality of blocks, an automatic opening and closing valve installed at an outlet port connected to each of said blocks, and pressure responsive means for opening said outlet port only when the corresponding block is to be purged.

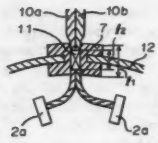
4,985,654
BRUSH DEVICE FOR A MOTOR

Hiroyuki Morikane, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1989, Ser. No. 424,045
Claims priority, application Japan, Nov. 26, 1988, 63-154022[U]
Int. Cl.[5] H02K *13/00*
U.S. Cl. 310—249 **2 Claims**

1. A brush device for a motor, comprising: two elongated, multi-strand lead wires (**10***a*,**10***b*), a brush (**2***a*) connected to one end of each lead wire, a terminal (**6**) connecting another, opposite end of each lead wire together, a predetermined portion of each of said two elongated multi-strand lead wires being juxtaposed and firmly attached together at an intermediate position to form a one-piece waist segment having a cross-sectional area smaller than that of said two elongated multi-strand lead wires at unattached positions and a rubber grom-

met having an axial length greater than that of said segment sealingly disposed surrounding said segment, a smaller cross-sectional area of said segment serving to fixedly locate the



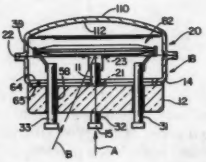
grommet and prevent any movement thereof along the lead wires, and serving to prevent any water entry from a terminal side by capillary action along the lead wires.

4,985,655

CRYSTAL HEADER PACKAGE

Charles J. Jensik, and William P. Hanson, both of Carlisle, Pa., assignors to Piezo Crystal Company, Division of PPA Industries, Inc., Carlisle, Pa.

Filed May 27, 1988, Ser. No. 199,647
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—344 **9 Claims**



1. A crystal header package for mounting a crystal, said package comprising;

a base member made of a single crystal of sapphire, said base member having a top surface, a bottom surface and a peripheral side surface joining said top and bottom surfaces;

a metallic housing having an opening defined by a planar ring portion, said ring portion being sized to mate with said top surface in order to create a seal between an interior of said housing and said top surface of said base member, said interior of said housing and said to surface of said base member defining a sealed chamber, the housing including an outwardly extending dome for increasing shock resistance of the header package;

a metallic ring interposed between said top surface of said base member and said ring portion, said metallic ring being made of KOVAR;

a plurality of terminals for mounting said header package, said terminals passing through apertures defined within said base member;

means for sealing said terminals within said apertures; and

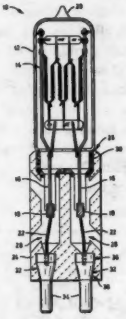
a metallic ribbon connecting means electrically connected to a plurality of said terminals for mounting and supporting said crystal within said sealed chamber defined within said housing.

4,985,656

LAMP WITH RE-ENFORCED TUBULAR BASE PINS

Arnold Westlund, Jr., Winchester, and Jeffrey P. Buschmann, Lexington, both of Ky., assignors to GTE Products Corporation, Danvers, Mass.

Filed Sep. 5, 1989, Ser. No. 402,394
Int. Cl.[5] H01J *5/48, 5/50*; C04B *7/00*
U.S. Cl. 313—318 **17 Claims**



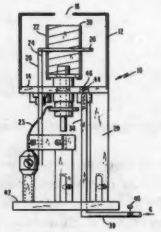
1. A re-enforced tubular base pin as used in an electric lamp for compressive coupling to an electrical source, the pin comprising: an electrically conductive tube having an exterior surface along which a compressive electrical coupling may be made, and an interior surface defining an internal volume, and a substantially rigid cement positioned in the internal volume to substantially fill the volume at least along the portions opposite where compressive coupling may be made to the exterior surface of the tube.

4,985,657

HIGH FLUX ION GUN APPARATUS AND METHOD FOR ENHANCING ION FLUX THEREFROM

Charles T. Campbell, Bloomington, Ind., assignor to LK Technologies, Inc., Bloomington, Ind.

Filed Apr. 11, 1989, Ser. No. 336,371
Int. Cl.[5] H01J *27/02*
U.S. Cl. 313—362.100 **17 Claims**



1. An improvement to a filament-type electron impact ion source that provides within an evacuated target chamber and ion flux directable to a target suitably located therein, wherein the improvement comprises:

means for providing a flow of an ionizable gas directly into said ion source for molecules of the gas to be ionized therein for delivery therefrom of said ion flux; and

means for regulating said flow of ionizable gas directly into said ion source and through said ion source into the target chamber such that a first partial pressure of said ionizable gas inside said ion source is maintained higher than a

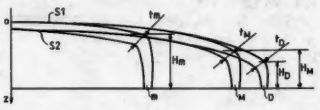
second partial pressure of said gas outside said ion source but still within said target chamber during generation of said ion flux, wherein said regulating means comprises a user-operable flow control valve located between said target chamber and a supply of said ionizable gas.

4,985,658

FRONT PANEL FOR COLOR TELEVISION TUBES

Giuliano Canevazzi, Grottaferrata, Italy, assignor to Videocolor, Courbevoie, France

Filed Jul. 25, 1989, Ser. No. 385,154
Claims priority, application France, Jul. 27, 1988, 88 10116
Int. Cl.[5] H01J *29/86*
U.S. Cl. 313—477 R **8 Claims**



1. A front panel for color television tubes, suited to high-definition television, each of the external and internal surfaces of which is of the type defined by a surface with an equation,

$$Z=\Sigma(C(i)\cdot X^{j(i)}\cdot y^{k(i)})$$

where Z is the difference from any point of the surface to the plane tangential to the center of this surface, wherein the coefficients C(i) have the equation,

$$C(i)=Co(i)\cdot F^{-(j(i)+k(i)-1)}$$

where the coefficients C(i) describe the group of front panels according to the invention for screen shapes determined by F, F being the ratio of the diagonals of one and the same group and being equal to 1 for a screen with a ratio 16/9 and a diagonal equal to 83 cm (33 inches) or a screen with a ratio of 4/3 and a diagonal of 68 cm (27 inches), the sum relating to the whole number finite index i, x and y being the Cartesian coordinates of the points of this surface, and j and k being whole number coefficients respectively equal to 4, 2, 0, 4, 2, 0, 4, 2 for j, and equal to 4, 0, 2, 0, 2, 4, 2, 4 for k when i varies from 1 to 8 the coefficients Co(i) being given in the tables below for ratios of 16/9 and 4/3,

[For] for 16/9[:]

i	Co(i)	j(i)	k(i)
1	−.23773301E-18	4	4
2	.84293632E-04	4	0
3	.43121367E-03	2	0
4	.18365999E-08	4	0
5	−.17170219E-08	2	2
6	.79434857E-09	0	4
7	.57689504E-14	4	2
8	.24894724E-13	2	4

[For] for 4/3[:]

i	Co(i)	j(i)	k(i)
1	−.58544384E-18	4	4
2	.11218491E-03	2	0
3	.35359521E-03	0	2
4	.43294582E-08	4	0
5	−.23872190E-08	2	2
6	.65136582E-09	0	4
7	.14001255E-13	4	2
8	.35119581E-13	2	4

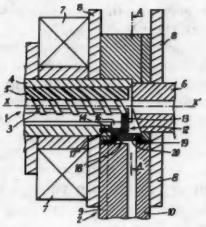
where x and y are in millimeters.

4,985,659

TRAVELLING WAVE TUBE PROVIDED WITH AN IMPERVIOUS COUPLING DEVICE BETWEEN ITS DELAY LINE AND AN EXTERNAL MICROWAVE CIRCUIT

Jacques Tikes, Orsay; Joël Le Fur, Richebourg, and Pierre Nugues, Auneau, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Oct. 10, 1989, Ser. No. 419,326
Claims priority, application France, Oct. 11, 1988, 88 13342
Int. Cl.[5] H01J *23/42*
U.S. Cl. 315—3.5 **2 Claims**



1. A travelling wave tube comprising:

a delay line contained in a sheath, located along a first direction;

a coupling pin, connected to the delay line, to couple the delay line with a transmission line of an external microwave circuit;

the transmission line being located along a second direction different from the first direction, and possessing an internal conductive core which has an end surface;

the coupling pin having a coupling surface located so that it faces the end surface of the conductive core said coupling pin and said conductive core being mechanically independent;

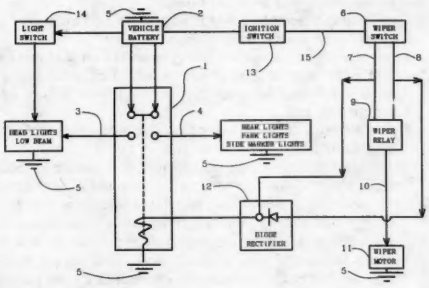
wherein a vacuum-tight window with a wall permeable to microwave energy, is tightly fixed to said travelling wave tube, said vacuum-tight window extending between the coupling surface of the coupling pin and the end surface of the conductive core, and being mechanically independent from said coupling pin and from said conductive core.

4,985,660

VEHICLE WINDSHIELD WIPER LIGHT CIRCUIT

John E. Cronk, 2594 Spruce Creek Blvd., Daytona Beach, Fla. 32127

Filed Feb. 7, 1990, Ser. No. 476,178
Int. Cl.[5] B60Q *1/02*
U.S. Cl. 315—82 **4 Claims**



1. An automatic windshield-wiper light circuit in a motor

vehicle having headlights, tail lights, auxiliary lights and an electrical windshield wiper in electrically-operative circuitry with an electrical supply source comprising:

an intermittent-current electrical line in electrical communication between a windshield-wiper switch and a windshield-wiper relay switch;

a multiple-speed electrical line in electrical communication between the windshield-wiper switch and the windshield-wiper relay switch;

rectifier circuitry in electrical communication between the intermittent-current electrical line and the multiple-speed electrical line.

a diode rectifier in the rectifier circuitry;

an automatic light relay switch in current-communicative relationship between the windshield-wiper switch and select lights of the vehicle; and

an electrical circuit in communication between the lines to the windshield-wiper relay switch and the automatic light relay switch when the windshield wiper-switch is switched to electrical communication with the electrical supply source.

4,985,661

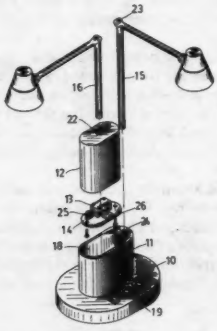
UNINTERRUPTED DESK LAMP

Yuang-Chang Lin, No. 100, Shan Hsi Tung Wu Street, North District, Taichung, Taiwan

Filed Sep. 27, 1989, Ser. No. 413,027

Int. Cl.[5] H05B *39/10*

U.S. Cl. 315—87 **2 Claims**



1. An uninterrupted desk lamp, including:

a base;

a main seat upstanding from said base, comprising a notch for setting therein of an auxiliary seat;

an auxiliary seat being seated in said notch of said main seat;

a AC power failure lighting circuit comprised of a battery, a transformer, and a circuit board;

a main lamp assembly being mounted on said main seat and comprising a main lamp bulb;

an auxiliary lamp assembly being mounted on said auxiliary seat and comprising an auxiliary lamp bulb, said auxiliary lamp bulb being connected with said power failure lighting circuit; and

a photoresistor being mounted on the inner wall surface of said main seat;

characterized in that said transformer is connected through a rectifying diode to the positive terminal of said battery to provide a semiwave rectifying-charging circuit to charge said battery, said AC power failure lighting circuit comprising a secondary coil bridged with a capacitor series connected with another diode, said capacitor having its both ends respectively connected to the negative end and the gate of a silicon controlled rectifier, said silicon controlled rectifier having its positive end series connected to said auxiliary lamp bulb to further connect to said battery and having its gate connected to the positive terminal of the battery, said photoresistor being to form a bias voltage circuit with both ends respectively connected to said battery and the gate of said silicon controlled rectifier to detect ambient light intensity so as to turn on said auxiliary lamp bulb of said auxiliary lamp assembly, through the operation of said AC power failure lighting circuit, during AC power failure under low ambient light intensity.

4,985,662

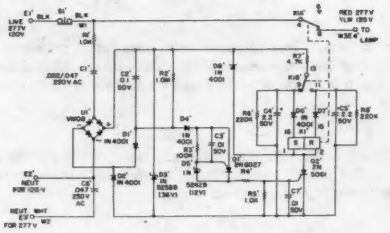
LOW VOLTAGE LAMP SWITCHER CIRCUIT

Martin E. G. Willcocks, Los Angeles, Calif., and Rhett McNair, Rte. 13, Box 398, Lake City, Fla. 32055, assignors to Rhett McNair, Lake City, Fla.

Filed Jun. 23, 1989, Ser. No. 370,755

Int. Cl.[5] H05B *41/46*

U.S. Cl. 315—90 **11 Claims**



1. A power switching circuit means for alternately switching off and on second lamp means in a group of first and second lamp means as the group of lamp means is repeatedly switched on, so that upon each alternate switching on of the group of lamp means the second lamp means remain switched off, comprising:

first and second terminals for connecting to a power source controlled by a main switch,

first lamp means connected to the terminals for providing illumination on every occasion when the main switch provides power to the terminals from the power source,

third terminal means,

switching means connected to said first and third terminals for alternatively connecting and disconnecting said third terminal from said first terminal,

second lamp means connected to said third and second terminals for providing illumination on each alternate occasion when the main switch provides power to the terminals from the power source,

power conversion means connected to said first and second terminals for converting power from the power source to a regulated direct current output,

control circuit means connected to the direct current output of said power conversion means for operating said switching means, comprising means for detection of disconnection of power from said first and second terminals, operating means for switching said switching means for a first condition to a second condition and from the second condition to the first condition and means for determining which of said first and second conditions said switching means is in while power is applied to said first and second terminals, wherein the said power conversion means comprises a bridge rectifier means having two input terminals and a positive and a negative output terminal, a first capacitor connected in series with one of said input terminals and in series with a first resistor to said second terminal, the other of said input terminals being connected to said first terminal, a first diode means whose cathode is con-

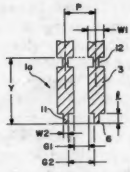
nected to said negative output terminal, a Zener diode whose cathode is connected to said positive output terminal and whose anode is connected to the anode of said first diode means, and across which an essentially constant direct voltage is developed for supplying said control circuit means, said first resistor being provided to limit the maximum surge current into said first capacitor to a safe value.

4,985,663

DISPLAY DEVICE

Hiroshi Nakatani, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Oska, Japan

Filed Sep. 8, 1988, Ser. No. 242,433
Claims priority, application Japan, Sep. 9, 1987, 62-137714[U]
Int. Cl.[5] G02F *1/13*; G09G *3/02*; H01L *23/02*; H02G *3/06*
U.S. Cl. 315—169.3 **7 Claims**



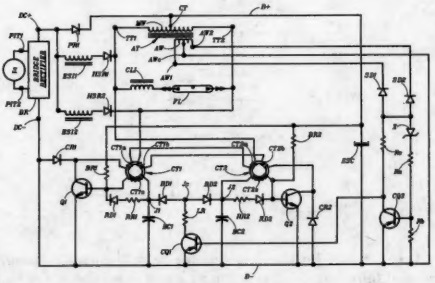
1. A display device comprising:
a display panel having a plurality of electrodes;
a driver circuit having electrodes corresponding to the electrodes of said display panel; and
anisotropic conductive film for electrically connecting the electrodes of said display panel with the electrodes of said driver circuit;
wherein each driver circuit having a connecting part to be connected with each electrode of said display panel comprises a first connecting portion and a second connecting portion, said first connecting portion having a smaller width than said second connecting portion.

4,985,664

ELECTRONIC BALLAST WITH HIGH POWER FACTOR

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Filed Oct. 12, 1989, Ser. No. 429,209
Int. Cl.[5] H05B *41/00*
U.S. Cl. 315—209 R **14 Claims**



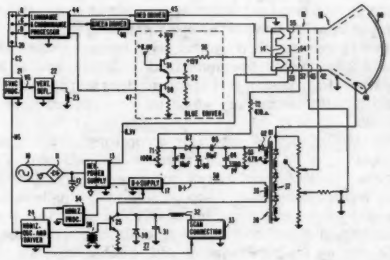
1. An arrangement comprising:
a first set of DC supply terminals having a first DC voltage thereacross; the first DC voltage having a periodically varying magnitude;
a second set of DC supply terminals having a second DC voltage thereacross; the second DC voltage having a substantially non-varying magnitude;
an inverter connected with the second set of DC terminals; the inverter also being connected via an inductor means with the first set of DC terminals; the inverter being operative to provide a squarewave voltage across a set of inverter output terminals; the squarewave voltage having a substantially non-varying magnitude; and
gas discharge ligthing means connected in circuit with the inverter output terminals and operative to be powered therefrom by way of a current-limiting means;
the arrangement being so constituted that a substantial part of all the power supplied to the gas discharge lighting means is being supplied from the first set of DC supply terminals via the inductor means.

4,985,665

BLACK LEVEL TRACKING FOR MULTIPLE FREQUENCY APPARATUS

Gene K. Sendelweck, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Continuation of Ser. No. 897,187, Aug. 15, 1986, abandoned.
This application Jul. 18, 1988, Ser. No. 220,988
Int. Cl.[5] H01J *29/52*
U.S. Cl. 315—386 **10 Claims**



1. A video display apparatus operable at a plurality of line deflection frequencies comprising:
a cathode ray tube comprising an electron gun assembly incorporating a control grid and incorporating a screen grid coupled to a source of potential having a level determined in response to said line deflection frequency such that a given change in said line deflection frequency causes a corresponding change in a voltage that is developed at said screen grid; and
a power supply for said control grid comprising:
means for generating a signal having an amplitude dependent upon said line deflection frequency;
means responsive to said signal and coupled to said control grid for generating a direct voltage that is applied to said control grid having a predetermined level at a corresponding line deflection frequency that changes in accordance with said given change in said line deflection frequency, said direct voltage being generated in such a way that any ratio value of the change in said level of said direct voltage to said predetermined level of said direct voltage may be selected from a range of ratio values so as to compensate for said change in said voltage that is developed at said screen grid; and
means for applying said direct voltage to said control grid.

4,985,666

SAFETY DEVICE FOR VIDEO CASSETTE RECORDER

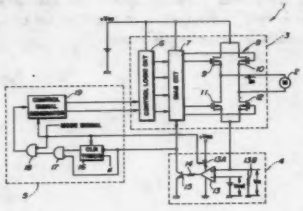
Toshiya Nakabayashi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 398,967

Claims priority, application Japan, Aug. 30, 1988, 63-215501; Aug. 30, 1988, 63-215502

Int. Cl.[5] H02P 3/08

U.S. Cl. 318—434 14 Claims



1. Motor control apparatus comprising: drive means for supplying drive current to a motor and including a power source, variable impedance switch means selectively energized for coupling said motor to said power source, and bias means for varying the impedance of said variable impedance switch means to limit current supplied therethrough to said motor; overload detecting means coupled to said motor for detecting the magnitude of current flowing through said motor to produce an output signal if motor overload causes said current to exceed a predetermined threshold level; control means coupled to said overload detecting means and responsive to said output signal to control the bias means and thereby adjust the drive current supplied by said drive means to said motor for controlling motor operation; and enable means selectively operable for enabling said overload detecting means to detect said motor current only when motor overload is to be detected.

8. Motor control apparatus comprising: drive means for supplying drive current to a motor and including a power source, variable impedance switch means having plural transistor means connected in H-configuration to couple said motor to said power source and selectively energized to supply current to said motor in first or second directions, and bias means for varying the impedance of said variable impedance switch means to limit current supplied therethrough to said motor, said bias means including plural energizing switch means, each coupled between said power source and a respective one of said transistor means and activated by an energizing signal to apply an energizing voltage to the transistor means coupled thereto, and means for shunting a substantial portion of said energizing voltage from said transistor means to increase the impedance of said transistor means; overload detecting means coupled to said motor for detecting the magnitude of current flowing through said motor to produce an output signal if motor overload causes said current to exceed a predetermined threshold level, with said means for shunting being responsive to said output signal; and control means coupled to said overload detecting means and responsive to said output signal for controlling the bias means and thereby adjusting the drive current supplied by said drive means to said motor, thereby controlling motor operation, said control means including means for supplying energizing signals to selected pairs of said transistor means to cause forward or reverse movement of said motor, or to cause braking of said motor, and being additionally operable to deenergize all of said transistor means for interrupting current to said motor and thereby causing said motor to stop.

9. Motor control apparatus comprising: drive means for supplying drive current to a motor and including a power source, variable impedance switch means selectively energized for coupling said motor to said power source, and bias means for varying the impedance of said variable impedance switch means to limit current supplied therethrough to said motor; overload detecting means coupled to said motor for detecting the magnitude of current flowing through said motor to produce an output signal if motor overload causes said current to exceed a predetermined threshold level; and control means coupled to said overload detecting means and responsive to said output signal for controlling the bias means and thereby adjusting the drive current supplied by said drive means to said motor for controlling motor operation, said control means including timer means for sensing the presence of said output signal for a predetermined time duration before timing out and controlling the drive current supplied to said motor.

12. Motor control apparatus comprising: drive means for supplying drive current to a motor and including a power source, variable impedance switch means selectively energized for coupling said motor to said power source, and bias means for varying the impedance of said variable impedance switch means to limit current supplied therethrough to said motor; overload detecting means coupled to said motor for detecting the magnitude of current flowing through said motor to produce an output signal if motor overload causes said current to exceed a predetermined threshold level; said overload detecting means including current level generating means for generating a current level signal representative of the motor current, reference means for providing a reference signal representative of a reference motor current and comparator means for comparing said current level signal to said reference signal to produce said output signal if said current level signal exceeds said reference signal; and control means coupled to said overload detecting means and responsive to said output signal for controlling the bias means and thereby adjusting the drive current supplied by said drive means to said motor for controlling motor operation.

4,985,667

DEVICE FOR PIVOTING A MOTOR-VEHICLE MIRROR FROM THE NORMAL POSITION TO A NON-DAZZLE POSITION

Willi Kühn, Bleckede, Fed. Rep. of Germany, assignor to Frank Brinckmann, Hamburg, Fed. Rep. of Germany

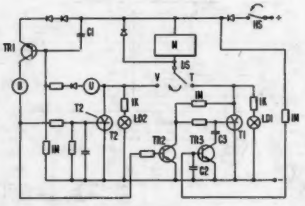
PCT No. PCT/EP88/00720, § 371 Date Mar. 31, 1989, § 102(e) Date Mar. 31, 1989, PCT Pub. No. WO89/01428, PCT Pub. Date Feb. 23, 1989

PCT Filed Aug. 11, 1988, Ser. No. 346,992

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3727033

Int. Cl.[5] G05B 19/10

U.S. Cl. 318—567 6 Claims



1. In a device for pivoting a motor-vehicle mirror between a normal fully reflecting position to a non-dazzle partly reflecting position in response to the presence of glare from the headlight of a following vehicle and ambient light conditions, said device comprising a voltage source, a motor having a shaft acting upon said mirror through a tilting mechanism, and first and second thyristers controlling energization of said motor, and circuit means for energizing and de-energizing said thryisters in accordance with the presence of glare and interference from ambient light, the improvement wherein said circuit

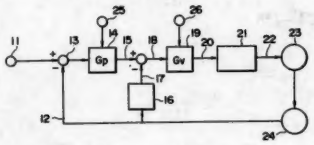
means includes a bipolar rotary switch connected in series with said motor, said switch interrupting the flow of current through said motor at specific angles of rotation of the shaft of said motor, disconnecting the previously conducting thyrister from the voltage source and switching it off and wherein the tilting mechanism comprises a crank-disk driven by said motor with a crank pin and a connecting rod which is moved back and forth by means of said crank pin, said connecting rod being connected to said mirror and having a substantially elliptical opening surrounding said crank pin, said elliptical opening defining areas of greater and lesser radial extension, the areas of said opening of lesser radial extension being associated with the normal and non-dazzle positions of said mirror and the areas of greater radial extension of said opening being associated with said specific angles of rotation of the shaft of said motor.

4,985,668

ROBOT CONTROLLER

Akira Nakazumi, Tokorozawa, and Nobuaki Imamura, Kobe, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 19, 1989, Ser. No. 409,316
Int. Cl.[5] G05B *19/42*
U.S. Cl. 318—568.2 **1 Claim**



1. A robot controller for controlling an articulated robot, comprising a position control system with a speed control minor servo loop for controlling the actuators of the articulated robot on the basis of position instructions, the improvement comprising:

memory means for previously storing functions for calculating position gains and speed gains for each joint of the articulated robot;

detecting means for detecting the present position and present speed of each of the joints during the operation of the articulated robot;

first calculating means for calculating a position gain and a speed gain for each joint on the basis of the present position and present speed of the joint detected by the detecting means by using the functions stored in the memory means; and

second calculating means for calculating instructions to be given to the actuators on the basis of position instructions, the present positions and present speeds of the joints detected by the detecting means, and the position gains and the speed gains calculated by the first calculating means.

4,985,669

MOTOR FEEDBACK SYSTEM

Robert C. B. Smith, Rocky Hill, Conn., assignor to Tri-Tech Inc., Waterbury, Conn.

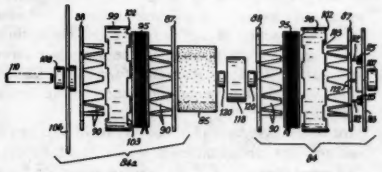
Filed Jul. 13, 1989, Ser. No. 379,546
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—685 **16 Claims**

1. An electrical rotating machine comprising, in combination:

an annular rotor including a first set of rotor poles around its outer peripheral surface and a second set of rotor poles around its inner peripheral surface;

a housing member surrounding the annular rotor in spaced relationship therewith;

at least one stator phase assembly connected to the housing member and annularly disposed around said rotor, the stator phase assembly having a plurality of salient stator poles in magnetic flux relationship with one of the outer and inner sets of rotor poles and having annular winding means for energizing the stator poles;



pick-up means in magnetic flux relationship with the other set of outer and inner rotor poles for sensing the position of the rotor; and

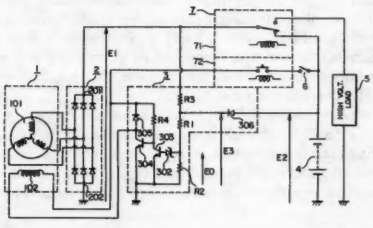
an energizing circuit connected to the annular winding means for applying electrical signals thereto by thereby drive said rotor.

4,985,670

VOLTAGE REGULATOR FOR AC GENERATOR WITH TWO DISTINCT OUTPUT VOLTAGE

Kazutoshi Kaneyuki, and Shiro Iwatani, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1989, Ser. No. 305,053
Claims priority, application Japan, Feb. 12, 1988, 63-31212
Int. Cl.[5] H02J *7/14*
U.S. Cl. 322—28 **6 Claims**



1. A voltage regulator circuit, for an AC generator including a field winding supplied with a field current from a battery coupled thereacross, and an armature winding in which AC voltages are induced by a magnetic field generated by the field winding, said voltage regulator circuit comprising:

rectifier circuit means, coupled to output terminals of said armature winding of said AC generator, for rectifying said AC voltages induced in said armature winding and outputting a DC voltage across positive and negative output terminals thereof;

selective coupling means for selectively coupling said battery and an electrical load across said positive and negative output terminals of said rectifier circuit means, said selective coupling means including a switch coupled to a terminal of said rectifier means and being alternatively positioned at a first and a second contact position, said switch selectively coupling said battery and said load across said positive and negative output terminals of said rectifier circuit means at said first and said second posi-

tion, respectively, said load being operated at a voltage higher than a voltage across said battery;

a first serial connection of a first (R_1) and a second (R_2) resistor, said first serial connection having a first terminal and a second terminal and being coupled across a positive and a negative terminal of said battery;

a rectifier diode having one of its terminals coupled to a terminal of said battery and the other of its terminals coupled to said first terminal of said first serial connection of two resistors, in serial circuit relationship with said first serial connection of the first and the second resistor, a forward direction of said rectifier diode coinciding with a direction from the positive to the anegative terminal of said battery in a serial circuit formed by said rectifier diode and said first serial connection of the first and the second resistor;

a third resistor (R_3) coupled across one of said terminals of said rectifier circuit means and said first terminal of said first serial connection of the first and the second resistor to which said rectifier diode is coupled, said third resistor and said first serial connection comprising a second serial connection;

voltage detector means for detecting a voltage at a junction between the first and the second resistor;

field current regulating means, having an input coupled to said voltage detector means and including a switching means coupled in series with said field winding, for interrupting said field current supplied from said battery by turning off said switching means when said voltage at said junction between the first and the second resistor detected by said voltage detector means exceeds a predetermined level;

wherein said first serial connection of the first and the second resistor constitutes a first voltage divider for detecting the output voltage of said rectifier circuit means when said switch of the selective coupling means is at said first contact position, and said second serial connection formed by the third, the first, and the second resistor constitutes a second voltage divider for detecting the output voltage of said rectifier circuit means when said switch of the selective coupling means is at said second contact position, said rectifier diode electronically switching said first serial connection and said second serial connection across said rectifier circuit means in response to operation of said selective coupling means and;

wherein a third serial connection is formed by said rectifier diode and the first (R_1) and the second (R_2) resistor, said third serial connection being directly coupled across the positive and negative terminals of said battery, and one of said battery terminals being coupled to a terminal of said field winding.

4,985,671

POWER SUPPLY CIRCUIT FOR A MOTOR VEHICLE WITH TWO LOAD VOLTAGES

Gerd Sauer, Stolberg-Venwegen, Fed. Rep. of Germany, assignor to Saint Gobain Vitrage, Courbevoie, France

Filed Jan. 23, 1989, Ser. No. 299,425

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1988, 3801478

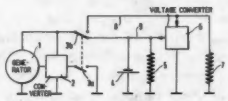
Int. Cl.[5] B60R *16/00*; H02M *3/00*

U.S. Cl. 323—282 **12 Claims**

1. A power supply circuit for a motor vehicle providing a first standard load voltage and a second load voltage greater than said first load voltage for a window heating unit, comprising:

a direct current generator which generates at least said second load voltage;

a voltage controller connected to said generator for producing said first load voltage when said window heating unit is switched off, said first load voltage being derived from said second load voltage when said window heating unit is switched on; and



a voltage converter for deriving said first load voltage from said second load voltage when said window heating unit is switched on.

4,985,672

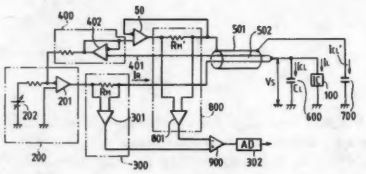
TEST EQUIPMENT FOR A LOW CURRENT IC

Yoshihiro Hashimoto; Shoji Yamazaki, and Shunsuke Katoh, all of Gyoda, Japan, assignors to Advantest Corporation, Tokyo, Japan

Filed Dec. 11, 1989, Ser. No. 448,506

Int. Cl.[5] G01R *31/28, 31/22*

U.S. Cl. 324—158 R **15 Claims**



1. An IC test equipment comprising:

a voltage source for applying a predetermined power source voltage to an IC under test;

first current detecting means for detecting current flowing from said voltage source to said IC under test;

a smoothing capacitor for smoothing pulsations of said voltage applied to said IC under test which are caused by its operation;

compensating means for generating a current equivalent to a charging/discharging current which flows through said smoothing capacitor when voltage is applied to a power source terminal of said IC under test;

second current detecting means for detecting said current generated by said compensating means; and

calculating means for subtracting the detected outputs of said first and second current detecting means one from the other to obtain the value of current flowing through said IC under test.

4,985,673

METHOD AND SYSTEM FOR INSPECTING PLURAL SEMICONDUCTOR DEVICES

Hajime Horie, Mitaka, Japan, assignor to Tokyo Seimitsu Co., Ltd., Mitaka, Japan

Filed May 18, 1989, Ser. No. 353,764

Claims priority, application Japan, Jun. 3, 1988, 63-137002; Mar. 31, 1989, 1-82656

Int. Cl.[5] G01R *31/00, 31/02*

U.S. Cl. 324—158 R **1 Claim**

1. A system for inspecting a plurality of items of each of a

plurality of semiconductor devices of the same kind, comprising:

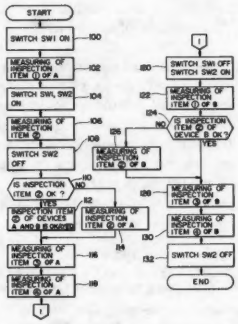
a plurality of measuring sections connected to a plurality of semiconductor devices, having one or more of said items which are capable of being inspected simultaneously and one or more of said items which are incapable of being inspected simultaneously, respectively;

a measuring-inspecting means for inspecting pass or fail of the semiconductor devices;

a plurality of switches interposed in parallel between the plurality of measuring sections and the measuring-inspecting means, for ON-OFF controlling electric connection between the measuring-inspecting means and the plurality of measuring sections; and

a control means for controlling the measuring-inspecting means and the plurality of switches; wherein:

said control means turns on only the switch of the plurality of switches which controls the electrical connection to a first of said plurality of semiconductor devices to cause said measuringinspecting means to inspect the items of the first semiconductor device which are incapable of being inspected simultaneously;



said control means simultaneously turns on the plurality of switches which control the electrical connections to said plurality of semiconductor devices to cause said measuring-inspecting means to inspect the items of the semiconductor devices which can be inspected simultaneously, and, when the simultaneous inspection of items fails, only the switch which controls the electrical connection to said first of the semiconductor devices is turned on to perform the inspection of items of the first semiconductor device which can be inspected simultaneously;

and, at the time of inspecting items of second and subsequent semiconductor devices, said control means turns on only the switch of said plurality of switches which controls the electrical connection to a respective one of the second and subsequent semiconductor devices being inspected to cause said measuring-inspecting means to inspect the items of the respective semiconductor device which are incapable of being inspected simultaneously, and when said simultaneous inspection of items fails to cause said measuring-inspecting means to also inspect all of the items of the respective semiconductor devices that are capable of simultaneous inspection.

4,985,674

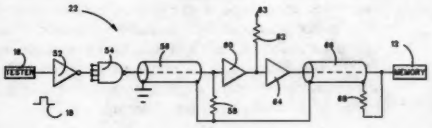
REAL TIME, HOSTILE ENVIRONMENT, MEMORY TESTER INTERFACE

Ralf D. Woods, Corona, and Brent D. Hooker, La Habra, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 16, 1989, Ser. No. 422,317

Int. Cl.[5] G01R *19/00, 1/00;* **H03K** *17/60*

U.S. Cl. 324—158 R **6 Claims**



3. An interface between an output of a memory tester and an input of a memory, comprising:

(a) an inverter having an input and an ouput, the input being connected to the output of the memory tester;

(b) a digital line driver having an input and an output, the input of the line driver being connected to the output of the inventer;

(c) a first coaxial cable, having an internal conductor and an external conductor, having an input end and an output end, the external conductor being grounded, and the internal conductor input end being connected to the output of the line driver;

(d) a first resistor connected between the output end of the first cable internal conductor and the first cable external conductor;

(e) a level shifter having an input and an output, the level shifter input being connected to the output end of the first cable internal conductor;

(f) a pull-up resistor connected between the output of the shifter and a level shifting voltage source;

(g) an analog line driver having an input and an output, the input being connected to the output of the level shifter;

(h) a second coaxial cable, having an internal conductor and an external conductor, having an input end and an output end, the external conductor being grounded, the internal conductor input end being connected to the output of the analog line driver, and the internal conductor output end being connected to the input of the memory; and

(i) a second resistor connected between the output end of the second cable internal conductor and the second cable external conductor.

4,985,675

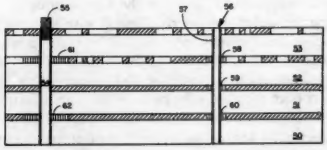
MULTI-LAYER TOLERANCE CHECKER

Andy Turudic, Hillsborough, N.C., assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 13, 1990, Ser. No. 479,272

Int. Cl.[5] G01R *31/02*

U.S. Cl. 324—158 R **7 Claims**



1. A method of determining alignment of layers in a multilayered printed circuit board, and determining minimum tolerance to internal circuit board arcing, comprising the steps of:

(a) forming a plurality of test openings, each of said plurality

of test openings traversing a number of layers of the multi-layered printed circuit board, at least one of said number of layers being a layer to be tested, and each of said plurality of test openings having a first plated annular wall;

(b) placing on each of said layers to be tested, a first non-conductive region surrounding each of said plurality of test openings, said first non-conductive region extending radially therefrom for a minimum specified distance corresponding to the minimum tolerance to internal circuit board arcing; and

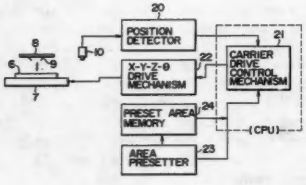
(c) determining an absence of an electrical path between an existing plated wall opening associated with each of said layers to be tested and each of said first plated annular walls, thereby determining the alignment of the multi-layered printed circuit board and the presence of minimum tolerance to internal circuit board arcing.

4,985,676

METHOD AND APPARATUS OF PERFORMING PROBING TEST FOR ELECTRICALLY AND SEQUENTIALLY TESTING SEMICONDUCTOR DEVICE PATTERNS

Wataru Karasawa, Yokohama, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Feb. 17, 1989, Ser. No. 312,045
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—158 R **6 Claims**



1. a method of performing a probing test for electrically and sequentially testing a plurality of chips formed in a matrix pattern upon a semiconductor wafer, comprising the steps of:

(1) storing map information in a storing means, which is an area map distinguishing chip area from non-chip area in accordance with types of the wafer, and includes the address data of monitor chips in the chip area and also the address data of the end chips in a matrix form;

(2) detecting a central point of the semiconductor wafer to insure the wafer is properly aligned with a probing means;

(3) reading out the map information from the storing means in accordance with types of the wafer;

(4) pre-aligning the wafer in an X-Y plane with reference to the probing means on the basis of the map information and the detected central point of the wafer;

(5) sequentially testing said plurality of chips one by one by starting at one corner of the matrix pattern, and at one end of a first row of chips, and proceeding in a direction across the row; and

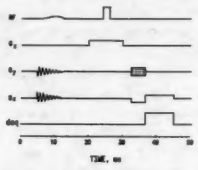
(6) testing a next row of chips by beginning at an opposite end and proceeding in an opposite direction.

4,985,677

MAGNETIC RESONANCE IMAGING AND SPECTROSCOPY USING AN EXCITATION PULSE FOR MULTIPLE-DIMENSIONAL SELECTIVITY

John M. Pauly, Menlo Park, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jun. 22, 1989, Ser. No. 370,403
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **12 Claims**



1. A method of obtaining multi-dimensional spatially selective magnetic resonance signals from a body comprising the steps of

(a) applying a static magnetic field (Bo) to said body thereby aligning nuclear spins along an axis (z),

(b) applying multiple time varying magnetic gradients Gx(t), Gy(t), Gz(t) during a time period, T, with said gradients chosen so that a region of spatial frequency space is covered,

(c) applying during said time period, T, an RF excitation pulse (B_1) to said body to tip said nuclear spins said RF excitation pulse being related to said times varying magnetic gradients by a first spatial frequency weighting function (W(k)(t)) whereby magnetic resonance signals transmitted by said tipped nuclear spins are spatially selective in multiple dimensions, (x,y,z), and

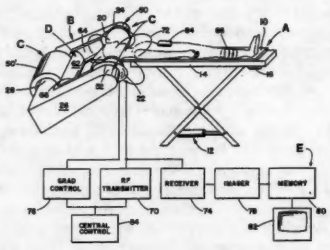
(d) detecting said magnetic resonance signals.

4,985,678

HORIZONTAL FIELD IRON CORE MAGNETIC RESONANCE SCANNER

Raymond E. Gangarosa, Decatur, Ga., and K. Ming Chui, Chagrin Falls, Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Oct. 14, 1988, Ser. No. 257,921
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—318 **19 Claims**



9. A magnetic resonance imaging apparatus comprising:

a patient supporting couch having a generally horizontal patient supporting surface, a longitudinal axis, and a transverse axis, whereby a patient is disposable on the patient supporting surface with its head and feet along the longitudinal axis and shoulders along the transverse axis;

a pair of pole pieces disposed adjacent opposite sides of the

patient supporting surface for providing a primary magnetic field air gap therebetween parallel to the transverse axis;

an adjusting means for adjusting a relative position of the patient supporting surface and the pole pieces;

a ferrous member interconnecting the pole pieces, the ferrous member being disposed principally below the patient supporting surface such that the patient is able to be moved freely between the pole pieces and substantial clearance is provided above the patient, the ferrous member including a pair of side members extending from the pole pieces generally parallel to each other and a connecting member that conencts the side members below the patient supporting surface;

a magnetic field driver connected with the connecting member for generating a magnetic flux loop through the connecting member, the side members, and the pole pieces to create a primary magnetic field across the air gap generally parallel to the transverse axis, the magnetic flux driver and the connecting member causing a secondary magnetic field in the air gap that bends the primary magnetic field out of parallel to the transverse axis;

shimming coils disposed contiguous to the pole pieces for optimizing uniformity of the primary magnetic field in the air gap;

a magnetic field correcting means disposed between at least the ferrous member connecting portion and the air gap for shielding the primary magnetic field from the effects of the secondary magnetic fields, whereby magnetic field bending caused by the cross member and magnetic field driver are rendered substantially invisible to the primary magnetic field in the gap;

gradient field coils for creating gradients in the primary magnetic field in the gap;

a coil assembly disposed adjacent the pole pieces for at least one of (i) transmitting radio frequency signals into the gap to induce resonance and (ii) receiving magnetic resonance signals emanating from resonating dipoles in the gap; and,

electronic circuitry for processing the magnetic resonance signals received by the receiver coil into an image representation.

4,985,679

MAGNET ASSEMBLY

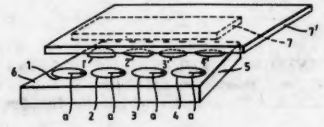
Ian L. McDougall, Oxford, United Kingdom, assignor to Oxford Magnet Technology Limited, London, England

Continuation of Ser. No. 210,172, Jun. 21, 1988, abandoned, which is a continuation of Ser. No. 807,949, Dec. 12, 1985, abandoned. This application Sep. 29, 1989, Ser. No. 445,113

Claims priority, application United Kingdom, Dec. 21, 1984, 8432439

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **15 Claims**



1. A magnetic assembly, comprising:

a plurality of magnetic field generating means, each having a magnetic field vector defined by a line from the north pole to the south pole and positioned in a volume so that the magnetic field vectors have substantially the same direction and are laterally spaced apart, for generating a magnetic field having controlled characteristics in a substantially planar region outside said volume.

4,985,680

RF COIL SYSTEM IN MAGNETIC RESONANCE IMAGING APPARATUS

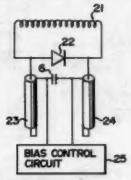
Tomohisa Maeda, and Kazuhiko Tsujita, both of Nishinasunomachi, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 17, 1989, Ser. No. 353,273

Claims priority, application Japan, May 20, 1988, 63-124494

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—322 **7 Claims**



1. An RF coil system comprising:

RF coil means for generating RF magnetic fields, and detecting magnetic resonance signals from a subject;

diode means having an anode and a cathode for providing a direct current bias, the diode means being series-connected to the RF coil means;

control means, having first and second terminals, for controlling on/off operation of the diode means;

first cable means for stopping an induced current from the RF coil means, including an open end and a short-circuited end each having center and outer terminals, one terminal open end of the first cable means being coupled to the anode, the other terminal of the open end of the first cable means being coupled to the first terminal of the control means, one terminal of the short-circuited end of the first cable means being connected to the other terminal of the short-circuited end of the first cable means and; and

second cable means for stopping an induced current from the RF coil means, including an open end and a short-circuited end each having center and outer terminals, one terminal of the open end of the second cable means being coupled to the cathode, the other terminal of the open end of the second cable means being coupled to the second terminal of the control means, one terminal of the short-circuited end of the second cable means being connected to the other terminal of the short-circuited end of the second cable means.

4,985,681

PARTICLE BEAM MEASURING METHOD FOR NON-CONTACT TESTING OF INTERCONNECT NETWORKS

Matthias Brunner, Kirchheim; Juergen Frosien, Ottobrunn; Reinhold Schmitt, and Burkhard Lischke, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich

Filed Dec. 27, 1985, Ser. No. 813,875

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1985, 3501562

Int. Cl.[5] G01R *31/00*

U.S. Cl. 324—501 **16 Claims**

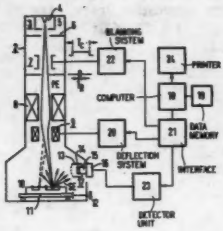
1. A particle beam measuring method for non-contact testing of an interconnect network for shorts and opens, comprising the steps of:

measuring reference signals at uncharged contact points before charging at least one point of the interconnect network, and intermediately storing the reference signals;

charging said at least one point of the interconnect network during a first time span by use of a particle beam of given energy directed to the at least one point;

subsequently directing the same particle beam with the same given energy to at least one further point of the same interconnect network; and

determining a potential at said at least one further point during a second time span by a measurement of secondary



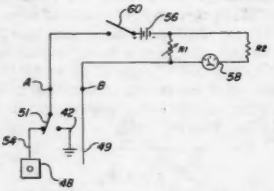
electrons emitted from said at least one further point, said second time span being significantly shorter in comparison to said first time span and the energy of said particle beam having the same value during both the first and second time spans.

4,985,682

LEAK MONITOR FOR SECONDARY CONTAINMENT OF LIQUID STORED IN UNDERGROUND STORAGE TANKS

Daniel A. Boryta, Downington, Pa., assignor to Leak Sensors, Inc., West Hartford, Conn.

Filed Nov. 20, 1986, Ser. No. 932,795
Int. Cl.[5] G01N *27/04*; G08B *21/00*
U.S. Cl. 324—557 **21 Claims**



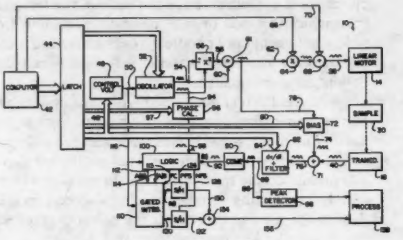
1. In a pond having a liner formed of electrically insulating polymeric material, and containing a layer of conductive liquid, a system for monitoring the continuity and for determining the rate of leakage of the liner which comprises a standard electrode and an injection electrode spaced from each other and in contact with said liquid, said standard electrode comprising a container of electrically insulating material for containing an electrically conductive liquid and having a hole in a wall thereof of predetermined dimensions through which the conductive liquid can contact said liquid in said pond, a ground electrode external of said pond and liner, a current source, means for monitoring resistance in an electrical circuit, and means for alternatively establishing a first electrical circuit comprising said injection electrode, said current source, said monitoring means and said standard electrode in series and a second electrical circuit comprising said injection electrode, said current source, said monitoring means and said ground electrode in series.

4,985,683

CIRCUITRY FOR MEASURING PHASE DIFFERENCE BETWEEN TWO OSCILLATORY SIGNALS

Michael J. O'Neill, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 24, 1988, Ser. No. 173,201
Int. Cl.[5] H03K *9/06*; G05F *5/00*
U.S. Cl. 328—133 **20 Claims**



1. A phase detecting circuit for measuring a phase difference between two oscillatory signals independently of frequency, comprising:

first wave form means associated with a first oscillatory signal having a selected operating frequency for producing a corresponding first square wave form;

second wave form means associated with a second oscillatory signal having the selected operating frequency and a phase difference from the first oscillatory signal for producing a corresponding second square wave form;

time signal means receptive of the first square wave and the second square wave form for producing successively at least one time signal per cycle of the first square wave form, each such signal being representative of a time difference corresponding to the phase difference;

voltage means for providing a control voltage proportional to the selected operating frequency; and

integrating means receptive of the control voltage and each successive time signal for producing an output signal proportional to the control voltage and proportional to each time signal successively such as to produce the output signal as representative of the phase difference independently of the selected operating frequency.

4,985,684

FULLY INTEGRATED DIGITAL FM DISCRIMINATOR

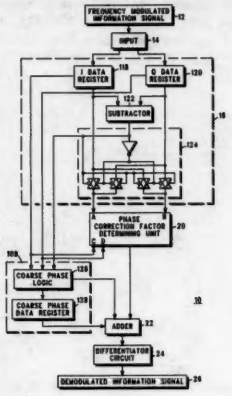
Bradley F. Jentz, Barrington, and Francis R. Yester, Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1989, Ser. No. 402,118
Int. Cl.[5] H03D *1/00*
U.S. Cl. 329—327 **10 Claims**

1. A digital FM discriminator comprising:

(A) a first means for receiving and processing a non-quantized signal that includes a frequency modulated information signal having a phase with an equivalent phase position to determine a coarse phase value and a fine phase value; and

(B) a second means responsive to the first means for outputting a demodulated information signal; and



wherein the first means and second means are formed integrally in a common substantially non-programmable integrated circuit.

4,985,685

DETECTOR CIRCUIT INCLUDING CURRENT ATTENUATING CIRCUIT AND CAPACITOR

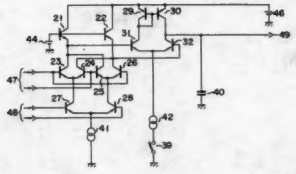
Kenji Hara, and Yoshio Wada, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Nov. 28, 1989, Ser. No. 442,308

Claims priority, application Japan, Nov. 28, 1988, 63-300021

Int. Cl.[5] H03D *1/00*

U.S. Cl. 329—349 **12 Claims**



1. A detector circuit comprising:

demodulating means for demodulating an input signal in accordance with a carrier wave applied to said demodulating means;

current attenuating means coupled with said demodulating means and for attenuating a signal from said demodulating means while keeping the information contained in the signal intact; and

capacitor means, coupled with the output of said current attenuating means, for smoothing a waveform of an output signal of said current attenuating means.

4,985,686

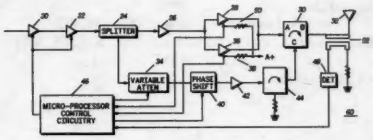
ACTIVE LOAD IMPEDANCE CONTROL SYSTEM FOR RADIO FREQUENCY POWER AMPLIFIERS

Robert P. Davidson, Chandler, Ariz., and Richard A. Rose, Hoffman Estates, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 4, 1989, Ser. No. 446,228

Int. Cl.[5] H03F *3/68*

U.S. Cl. 330—124 R **7 Claims**



1. An active load impedance control system for a radio frequency power amplifier comprising:

amplification means for amplifying radio frequency signals and providing forward signal;

control means responsive to the operating conditions of said amplification means,

correction signal means responsive to the control means for providing an amplitude and phase controlled corrective reflective signal.

combining means for combining said forward signal and said corrective reflective signal.

4,985,687

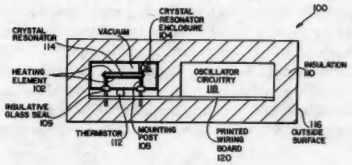
LOW POWER TEMPERATURE-CONTROLLED FREQUENCY-STABILIZED OSCILLATOR

Bruce R. Long, Carlisle, Pa., assignor to PPA Industries, Inc., Dallas, Tex.

Filed Feb. 27, 1990, Ser. No. 485,565

Int. Cl.[5] H03B *1/02, 5/04, 5/32*

U.S. Cl. 331—69 **8 Claims**



1. A temperature-controlled crystal resonator oscillator, comprising:

a resonator having a resonance frequency which varies as a function of the temperature of the resonator;

a heating element in substantially direct thermal contact with the resonator, for applying heat to the resonator;

a resonator enclosure containing in its interior the resonator and the heating element, the interior of the resonator enclosure being substantially a vacuum;

a heat-sensing device in substantially direct thermal contact with the resonator enclosure, for sensing the temperature on the resonator enclosure;

an insulative layer at least partially surrounding the resonator enclosure, so as to increase the thermal resistance between the resonator enclosure and an ambient environment; and

a feedback control circuit receiving the sensed temperature of the resonator enclosure and generating a heater control signal for determining the manner in which heat is applied to the resonator by the heating element;

wherein the control circuit provides dynamic control of the

resonance frequency of the resonator through feedback of the sensed temperature on the resonator enclosure in a substantially closed-loop manner.

4,985,688

MODULATION SYSTEM CAPABLE OF ACCURATELY COMPENSATING FOR NONLINEARITIES OF AN AMPLIFIER CONNECTED THERETO

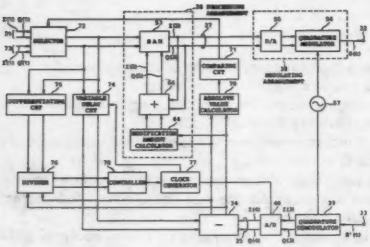
Yoshinori Nagata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 5, 1990, Ser. No. 459,387

Claims priority, application Japan, Jan. 6, 1989, 1-1835

Int. Cl.[5] H03C *3/08*

U.S. Cl. 332—123 **3 Claims**



1. A modulation system for processing and modulating a first sampled signal of a first sampling rate to supply a modulated analog signal to an amplifier having nonlinearities to make said amplifier produce an amplified output signal, said modulation system including: subtracting means for producing a difference signal representative of a difference between said first sampled signal and an additional digital signal; processing means connected to said subtracting means for processing said first sampled signal with reference to said difference signal to compensate for said nonlinearities to produce a processed signal; modulating means connected to said processing means for modulating said processed signal into said modulated analog signal; demodulating means connected to said amplifier for demodulating said amplified output signal into a demodulated signal; and converting means connected to said demodulating means for converting said demodulated signal into said additional digital signal at a specific rate; wherein the improvement comprises:

absolute value calculating means connected to said subtracting means for producing an absolute value of said difference signal;

comparing means connected to said absolute value calculating means for comparing said absolute value with a preselected threshold value to produce a first control signal when said absolute value is less than said threshold value and to produce a second control signal when said absolute value is not less than said threshold value; and

selecting means connected to said comparing means and said processing means and supplied with a second sampled signal of a second sampling rate for selecting said first and said second sampled signals as a selected signal to use said first and said second sampling rates as said specific rate when supplied with said first and said second control signals, respectively, said second sampling rate being equal to 1/N of said first sampling rate, where N represents an integer greater than one, said selected signal being substituted for said first sampled signal and processed and modulated into said modulated analog signal so long as said comparing means produces said second control signal.

4,985,689

MICROWAVE SEMICONDUCTOR SWITCH

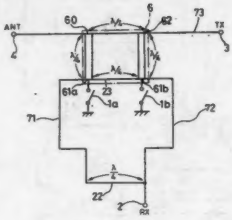
Yoshinobu Kadowaki, and Yutaka Yoshii, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 27, 1989, Ser. No. 413,214

Claims priority, application Japan, Sep. 30, 1988, 63-247606

Int. Cl.[5] H01P *1/10, 1/15*

U.S. Cl. 333—101 **4 Claims**



1. A microwave transmit-receive switch for switching between transmission and reception of microwave signals comprising:

a directional coupler having a directional isolation input terminal, a second input terminal, and first and second output terminals;

an antenna terminal connected to the second input terminal of said directional coupler;

a transmitting terminal connected to said directional isolation input terminal of said directional coupler;

first and second switching elements respectively connected between said first and second output terminals of said directional coupler and ground; and

a reception terminal connected to said first output terminal through a transmission line having no phase delay and to said second output terminal through a transmission line have a one quarter wavelength phase delay.

4,985,690

DIELECTRIC STEPPED IMPEDANCE RESONATOR

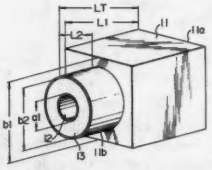
Kazuhiro Eguchi; Eiichi Ochiai; Shinichiro Ito; Takehiko Yoneda; Hiromitsu Taki; Toshiharu Noguchi; Kuniaki Kiyosue; Akiro Yoshida, all of Miyazaki; Morikazu Sagawa, Tama, and Mitsuo Makimoto, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 5, 1989, Ser. No. 375,417

Claims priority, application Japan, Jul. 7, 1988, 63-170410; Jul. 7, 1988, 63-170413

Int. Cl.[5] H01P *7/04*

U.S. Cl. 333—222 **3 Claims**



1. A coaxial dielectric resonator comprising:

a dielectric member having an outer surface and a longitudinally extending aperture formed therethrough so as to define a inner surface, said dielectric member including a first portion and a second portion, said first portion having a cylindrical shape and defining a first end, and said second portion being prism-shaped and defining a second end

providing a rectangular end face formed of four sides each having a length which is greater than an outer diameter of said first portion;

an outer conductor formed on said outer surface of said dielectric member;

an inner conductor formed on said inner surface of said dielectric member; and

a short-circuiting member electrically interconnecting said outer conductor with said inner conductor at said second end.

4,985,691

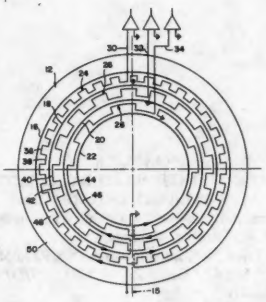
CONTACTLESS MOTION SENSOR

Yuly M. Pulyer, Farmingham, Mass., and Marlin H. Mickle, Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Continuation of Ser. No. 834,086, Feb. 26, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 257,150

Int. Cl.[5] H01F *21/06*

U.S. Cl. 336—130 10 Claims



1. Apparatus for providing information pertaining to the position and motion of an object comprising:

a stationary member; and

a moveable member;

said stationary member defining a generally planar first surface and including both a sensing conductor and an active electrical conductor, said sensing conductor and said active electrical conductor both being in generally planar configuration and disposed on said first surface;

said active electrical conductor and said sensing conductor being electrically insulated from one another;

said active electrical conductor being adapted to receive electrical power;

said sensing conductor comprising at least a first and a second zigzag pattern;

said active electrical conductor having a first portion, a second portion and a third portion, said first portion being disposed on a first side of said first zigzag pattern and said second portion being disposed on a second side of said first zigzag pattern opposite said first side of said first zigzag pattern;

said first and second portions being connected so that instantaneous current flowing in said first portion is opposite to instantaneous current flowing in said second portion;

said second portion being disposed on a first side of said second zigzag pattern and said third portion being disposed on a second side of said second zigzag pattern opposite said first side of said second zigzag pattern;

said second and third portions being connected so that instantaneous current flowing in said second portion is opposite to instantaneous current flowing in said third portion;

said movable member defining a generally planar second surface substantially parallel to said first surface;

said movable member comprising plurality of radially disposed and separate elements constructed at least partially of magnetic material;

said elements constructed at least partially of magnetic material electromagnetically coupling together said active conductor and said sensing conductor;

said coupling having a level of coupling determined by at least one of the motion and position of said movable member relative to said stationary member;

said elements constructed at least partially of magnetic material being positioned to overlie said sensing conductor and a portion of said active electrical conductor for inducing a signal in said sensing conductor when said active electrical conductor receives electrical power, such that said induced signal is of such magnitude which varies in relation to said level of coupling, whereby said induced signal conveys information pertaining to at least one of the position and motion of said moveable member relative to said stationary member.

4,985,692

WORD PROCESSOR WORK STATION WITH A BRAILLE READING LINE

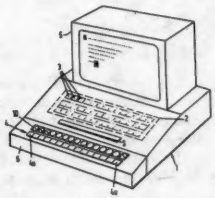
Jacob Breider, and Arend R. Arends, both of Groningen, Netherlands, assignors to Vennootschap onder firma: ALVA, Netherlands

Filed Jan. 20, 1988, Ser. No. 145,911

Claims priority, application Netherlands, Jan. 23, 1987, 8700164

Int. Cl.[5] H03M *11/00*

U.S. Cl. 340—407 19 Claims



19. A switching device for cursor control for use in a system that includes an elongated braille reading line with separate braille reading cells, characterized in that the device has an elongate shape corresponding with the elongate shape of the braille reading line and that during operation, the switching device is adjacent each braille reading cell and actuable without displacing the hand from the braille reading line.

4,985,693

CAR THEFT PROOFING SYSTEM

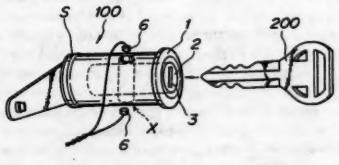
Sadakatsu Sunami, 8-3, Asukanokita 3-chome, Ikoma-shi, Naraken, Japan

Filed Aug. 11, 1989, Ser. No. 392,516

Claims priority, application Japan, Nov. 18, 1988, 63-293413

Int. Cl.[5] B60R *25/10*

U.S. Cl. 340—426 16 Claims



1. A car theft proofing system comprising a sensor disposed

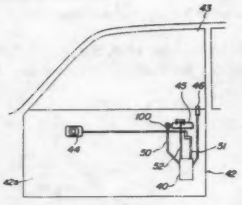
adjacent a cylinder lock for detecting insertion into the cylinder lock of a door key or other article, an alarm device for giving an alarm, alarm drive means to output a signal for driving the alarm device, control means to cause the alarm device to give an alarm in response to a signal received from the sensor and a signal received from the alarm drive means, and a radio transmitter for detecting insertion of the article and transmitting a radio wave, wherein said alarm drive means includes a portable remote control transmitter and a receiver disposed on a car body, said remote control transmitter including abnormality alarm means for transmitting a theft signal in response to the radio wave transmitted from radio transmitter.

4,985,694

CAR THEFT PROOFING SYSTEM

Sadakatsu Sunami, 8-3, Asukanokita 3-chome, Ikoma-shi, Nara-ken, Japan

Filed Aug. 11, 1989, Ser. No. 392,340
Claims priority, application Japan, Nov. 18, 1988, 63-293412
Int. Cl.[5] B60R *25/10*
U.S. Cl. 340—426 **22 Claims**



1. A car theft proofing system comprising an elongate sensor attached to a door lock mechanism for detecting insertion into the door lock mechanism of a plate, bar or other article, an alarm device for giving an alarm, alarm drive means to output a signal for driving the alarm device, control means to cause the alarm device to give the alarm in response to a signal received from the elongate sensor and the signal from the alarm drive means, and a radio transmitter for detecting insertion of the article and transmitting a radio wave, wherein said alarm drive means includes a portable remote control transmitter and a receiver disposed on a car body, said remote control transmitter including abnormality alarm means for transmitting a theft signal in response to the radio wave transmitted from said radio transmitter.

4,985,695

COMPUTER SECURITY DEVICE

William T. Wilkinson, Fairville and Cossart Rds., Chadds Ford, Pa. 19317, and James E. Bent, 30 Cartier Ct., Newark, Del. 19711

Filed Aug. 9, 1989, Ser. No. 391,232
Int. Cl.[5] G08B *13/14*; E05B *69/00*; H01R *13/70*
U.S. Cl. 340—571 **15 Claims**

1. A computer security device for protecting the components of a personal computer system or the like comprising a housing having top, bottom, front, rear and side walls, a door for providing access to the interior of said housing, said housing including at least three compartments wherein there is simultaneous access to the interior of said compartments when said door is opened, one of said compartments being a disk storage compartment which is lined with low reluctance shielding material, lock means for preventing access to said interior, electrical control means including internal power surface means in another one of said compartments in said housing, a main power source in said housing for supplying power to said internal power source means, said power source means including outlet means whereby the electrical power cords of the system components may be plugged into said

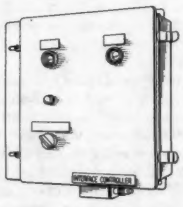
outlet means, and means for locking the component power cords to said housing.

4,985,696

ELECTRONIC CONTROLLER BY RESISTIVITY OF WATER-OIL INTERFACE

Jorge J. Beomont, Campo Morichal, Venezuela, assignor to Lagoven S.A., Caracas, Venezuela

Filed Nov. 20, 1986, Ser. No. 932,855
Int. Cl.[5] G08B *21/00*; G01F *23/00*
U.S. Cl. 340—618 **7 Claims**



1. An electronic interface controller comprising:

sensor elements for generating a signal representative of current flow therebetween when said elements are disposed in conductive liquids providing an interface to be controlled;

first means, responsive to a current flow signal from said sensor elements, for generating a control signal according to the conductivity of liquid in contact with said sensor elements;

a timer for delaying a control signal from said first means for a delay period between 0 and 180 seconds;

second means, responsive to a current flow signal from said sensor elements, for generating a high interface level alarm signal when the conductivity of liquid in contact with said sensor elements exceeds a predetermined high interface level value; and

third means, responsive to a current flow signal from said sensor elements for generating a low interface level alarm signal when the conductivity of liquid in contact with said sensor elements is below a predetermined low interface level value.

4,985,697

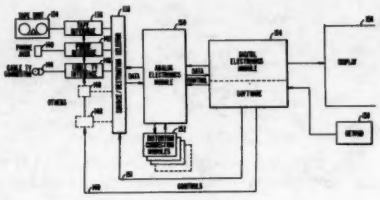
ELECTRONIC BOOK EDUCATIONAL PUBLISHING METHOD USING BURIED REFERENCE MATERIALS AND ALTERNATE LEARNING LEVELS

David A. Boulton, Santa Clara, Calif., assignor to Learning Insights, Ltd., San Jose, Calif.

Continuation-in-part of Ser. No. 69,667, Jul. 6, 1987, abandoned, and Ser. No. 58,093, Jun. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 821,580, Jan. 21, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 146,933

Int. Cl.[5] G09G *1/02*

U.S. Cl. 340—750 12 Claims



1. A method for compiling information for presentation on a monitor or through a voice synthesizer, comprising the steps of:

providing a first set of information requiring a first level of comprehension;

dividing said first set of information into first discrete subsets;

providing a second set of information, corresponding to said first set of information, having a second level of comprehension;

dividing said second set of information into second discrete subsets corresponding to said first discrete subsets;

indexing each of said first subsets to a corresponding one of said second subsets to accommodate switching between said subsets by a user of said monitor or voice synthesizer;

encoding said information on a magnetic tape as an analog sine wave with each half-cycle amplitude modulated to represent a data bit, said sets of information being on a first track of said tape and control signals for said indexing being on a second track of said tape;

converting said analog signal on a portion of said tape into an electrical signal;

converting said electrical signal into a series of digital bits;

storing said digital bits in a buffer;

converting said digital bits into a format representing characters; and

displaying said characters on said monitor.

4,985,698

DISPLAY PANEL DRIVING APPARATUS

Hiroyuki Mano; Terumi Takashi, both of Yokohama; Kazuhiro Fujisawa, Fujisawa; Kaoru Hasegawa, Chiba; Shinzo Matsumoto, Mobara, and Mitsuhisa Fujita, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 261,994

Claims priority, application Japan, Oct. 28, 1987, 62-270126

Int. Cl.[5] G09G *3/36*

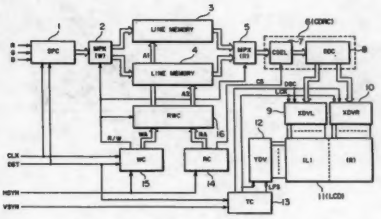
U.S. Cl. 340—784 9 Claims

9. A display panel driving apparatus comprising:

a display panel including pixels arranged in M rows and N columns to display data by those of the pixels which are selected by a combination of row-direction signal wires and column-direction signal wires, said display panel being divided into a plurality of display areas separated by the column-direction signal wires;

memory means including a plurality of memory regions corresponding to said plurality of display areas of said display panel, wherein data is successively written in said plurality of memory regions in sequential order in a data write mode;

a column-direction signal wire drive circuit connected to said memory means, said drive circuit including a plurality of column driving means corresponding to said plurality of display areas of said display panel, wherein data is simultaneously supplied to said plurality of column driving means from said plurality of memory regions of said



memory means, respectively, each of said plurality of column driving means being connected to those of the column-direction signal wires associated with one of said plurality of display areas of said display panel so as to supply data read out from said memory means to the column-direction signal wires; and

a row-direction signal wire drive circuit for successively selecting the row-direction signal wires.

4,985,699

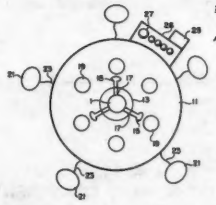
FREE STAND WITH PROGRAMMABLE MUSIC PROGRAM PLAYING MEANS

Albert D. Evans, 18456 Middle Delaware, Henderson, Ky. 42420

Filed Aug. 29, 1989, Ser. No. 399,966

Int. Cl.[5] G05B *19/00*; G11B *31/00*; A47G *33/12*

U.S. Cl. 340—825.240 7 Claims



1. In a tree stand including a base and means for supporting a tree thereon, the improvement comprising:

(a) a programmable control means;

(b) a program playing device electrically connected to said programmable control means;

(c) a plurality of switches electrically connected to said programmable control means;

(d) said switches being placeable adjacent said base;

(e) said program playing device having at least one program;

(f) at least one of said switches being biased to a normally closed position and openable responsive to placement thereon of a weight, whereby with said weight placed on said at least one of said switches and said at least one of said switches being in an open position, removal of said weight causes closure of said at least one of said switches causing said programmable control means to activate said program playing device to play said at least one program.

4,985,700

VARIABLE-LENGTH CODING/DECODING DEVICE

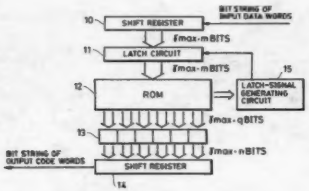
Fumiyuki Mikami, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 313,546

Claims priority, application Japan, Mar. 1, 1988, 63-47842; Mar. 1, 1988, 63-47849

Int. Cl.[5] H03M 7/00

U.S. Cl. 341—59 **12 Claims**



1. A variable-length coding device for converting an r-m-bit data word into an r-n-bit code word, where r is an integer having the relationship $1 \leqq r \leqq r_{max}$, a basic data word length consists of m bits (m being a positive integer), and a basic code word length consists of n bits (n being a positive integer), and converting each of the data words of a variable-length run-length-limited code limiting the run number of bits of a first value between successive bits of a second value in a binary-coded bit string generated by concatenation of code words after the conversion to a value no smaller than d and no larger than k (d and k being positive integers), into a code word corresponding thereto, said variable-length coding device comprising:

(A) first coding means for coding an input data word into r_{max}·q (q is a positive integer) bits, and outputting a first code word; and

(B) second coding means for dividing the first code word output from said first coding means into r_{max} blocks each consisting of q bits, coding a code word in each of the blocks, and outputting a second code word.

4,985,701

TIME-DIVISION BIT NUMBER CONVERSION CIRCUIT

Hisafumi Motoe, Tokyo; Masaharu Tokuhara, Kanagawa, and Takaya Hoshino, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 13, 1989, Ser. No. 379,107

Claims priority, application Japan, Jul. 28, 1988, 63-189475

Int. Cl.[5] H03M 7/00

U.S. Cl. 341—61 **8 Claims**

1. A bit number expansion system comprising:

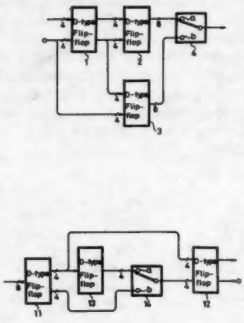
(a) a 2N bits signal input terminal where N is an integer;

(b) a first memory having 2N bits cells connected to said signal input terminal; said first memory having upper and lower inputs and upper and lower outputs;

(c) a second memory having 2N bits cells connected to the upper and lower outputs of the corresponding cells of said first memory, respectively;

(d) a third memory having 2N bits cells, said third memory having upper and lower input bit terminals which are connected to the lower outputs and the lower inputs of said first memory, respectively; and

(e) A first switch connected to the output of said second memory and to the output of said third memory for introducing expanded-bit output signals from one of N bits of said input terminal when said third memory is selected.



4,985,702

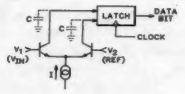
ANALOG TO DIGITAL CONVERTER WITH SECOND ORDER ERROR CORRECTION

Bruce J. Penney, Portland, Oreg., assignor to Triquint Semiconductor, Inc., Beaverton, Oreg.

Filed Apr. 2, 1990, Ser. No. 502,953

Int. Cl.[5] H03M 1/06

U.S. Cl. 341—118 **10 Claims**



1. An analog to digital converter with second order error correction comprising:

a quantizer having as an input an analog signal and as an output a digital output code;

means for determining a slope of the analog signal from the digital output code;

means for providing as a function of the slope a correction value; and

means for adding the correction value to the digital output code to produce a second order corrected digital output code.

4,985,703

ANALOG MULTIPLEXER

Hideyo Kaneyama, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 2, 1989, Ser. No. 305,538

Claims priority, application Japan, Feb. 3, 1988, 63-23482

Int. Cl.[5] H03K 17/56

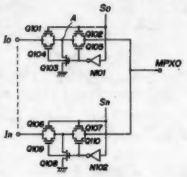
U.S. Cl. 341—141 **7 Claims**

1. An analog multiplexer for selecting one of (n+1) analog input signals, where n is a positive integer equal to or greater than one, which analog multiplexer comprises:

(n+1) MOS FET circuits, each MOS FET circuit having an

input connectable to one of the input analog signals and each having an output connected to a common output terminal from which a selected analog signal may be supplied to a following stage, each of said MOS FET circuits including a set of serially connected MOS FETs and each being responsive to a digital selection signal having two states to either transmit an analog signal at its input to the common output terminal or to block such transmission;

means for selectively applying a digital selection signal of one of the states to a selected one of the MOS FET circuits, while applying a digital selection signal of the other state to the other MOS FET circuits to transmit the analog signal from the input of the selected MOS FET circuit to the common output, while blocking transmission of an analog signal on the input to any other MOS FET circuit to the common output;



means responsive to the other state of the digital selection signal for applying a fixed electric potential to a serial connecting point of the set of serially connected MOS FETs; and

means for inhibiting the application of the fixed electric potential to the serial connecting point during a predetermined time duration including a time at which the digital selection signal changes between one state and the other state.

4,985,704

PROCESSING PARAMETER GENERATOR FOR SYNTHETIC APERTURE RADAR

Andrew M. Smith, Surrey, Great Britain, assignor to Scicon Limited, Milton Keynes, Great Britain

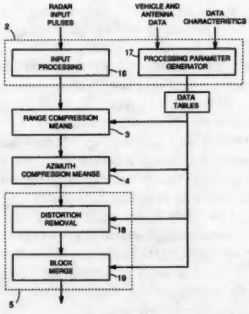
PCT No. PCT/GB88/00024, § 371 Date Nov. 14, 1988, § 102(e) Date Nov. 14, 1988, PCT Pub. No. WO88/05547, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 15, 1988, Ser. No. 250,630

Claims priority, application United Kingdom, Jan. 17, 1987, 8700973

Int. Cl.[5] G01S *13/90*

U.S. Cl. 342—25 **3 Claims**



1. A signal processor for synthetic aperture radar carried by a moving vehicle including an antenna, the radar using a beam which has a centre and is scanned over a surface to be imaged and mapped so as to trace out thereon a swath having near, far and centre positions, which processor comprises

(a) a processing parameter generator including processing blocks, the processing parameter generator serving for computation of processor filter parameters from the vehicle motion and antenna geometry as a continuously updated function of time,

(b) range compression means comprising

(i) pulse FFT means for performing an FFT on pulse echoes,

(ii) pulse replica multiplication means to effect pulse correlation,

(iii) squint compensation multiplication means to effect second order migration correction, and

(iv) inverse FFT means for performing an inverse FFT on the multiplied and compensated spectral data;

(c) azimuth compression means comprising

(i) row FFT means for performing an FFT on rows of data selected at constant range from overlapping blocks of range compressed data,

(ii) azimuth replica evaluator means, comprising range and phase polynomial evaluators and a complex exponentiator,

(iii) azimuth spectral buffer means, comprising a bank of storage to contain an adequately large number of row transforms,

(iv) data selection means comprising an interpolator to effect selection of data along curves in the spectral buffer means according to values computed by the range polynomial evaluator,

(v) azimuth replica multiplication means to effect multiplication of the selected data with the complex data generated by the phase polynomical evaluators, and

(vi) inverse FFT means to effect the inverse transform of rows of the processed data; and

(d) image formation means comprising image resampling and buffering means to effect image block geometric and phase discontinuity removal and image collation.

4,985,705

METHOD AND APPARATUS FOR COMPILING AND EVALUATING LOCAL TRAFFIC DATA

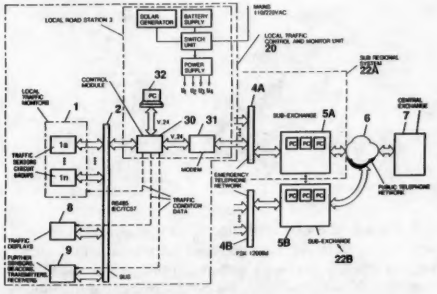
Walter Stammler, Ulm, Fed. Rep. of Germany, assignor to Telefunken Systemtechnik GmbH, Ulm, Fed. Rep. of Germany

Filed Mar. 27, 1989, Ser. No. 328,891

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810357

Int. Cl.[5] G01S *13/91*; G08G *1/081*

U.S. Cl. 342—69 **31 Claims**



1. A method of locally compiling and evaluating traffic data, comprising the steps of:

(a) using a radar sensor to emit a continuous signal at a constant frequency and amplitude, the signal being emitted from the radar sensor as a radar beam having a fixed angle of incidence with respect to the vertical;

(b) if an object intersects the radar beam and has as speed component in the direction of the radar beam, using the radar sensor to receive part of a signal reflected by the object, the signal reflected by the object being shifted in frequency with respect to the signal emitted by the radar sensor due to the Doppler effect;

(c) mixing the emitted signal and the reflected signal in the radar sensor to provide a first output signal at the difference frequency;

(d) conveying the first output signal to an evaluation unit using a transmission circuit which connects the radar sensor to the evaluation unit, the evaluation unit including lowpass filter means for avoiding spectral aliasing, the lowpass filter means receiving the first output signal, a signal processing unit, and an analog/digital converter connected between the lowpass filter means and the signal processing unit;

(e) using the signal processing unit to detect the beginning and end of the first output signal, by determining the energy of the first output signal occurring in a window which shifts over time, and by comparing the determined energy with first and second threshold values, the first time the determined energy exceeds the first threshold value identifying the beginning of the first output signal and the time thereafter when the determined energy falls below the second threshold value identifying the end of the first output signal;

(f) using the signal processing unit to form the frequency spectrum of the first output signal;

(g) determining the frequency at the maximum amplitude in the frequency spectrum; and

(h) deriving the speed of the object from at least one parameter, the at least one parameter including the frequency determined in step (f).

4,985,706

PROCESS FOR DATA TRANSMISSION BY MEANS OF A GEO-STATIONARY SATELLITE AND AT LEAST ONE SUB-SATELLITE

Manfred Schukat, Bruckmuehl/Goetting, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Ottobrunn, Fed. Rep. of Germany

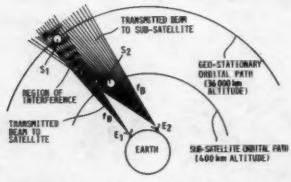
PCT No. PCT/EP87/00804, § 371 Date Oct. 17, 1988, § 102(e) Date Oct. 17, 1988, PCT Pub. No. WO88/04866, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 19, 1987, Ser. No. 250,622

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644176

Int. Cl.[5] H04B 7/185

U.S. Cl. 342—352 **2 Claims**



1. A method for transmitting data by means of a geo-stationary first satellite (S_1) on a geo-stationary orbit and at least one second satellite (S_2) on a different orbit at a smaller altitude than that of said geo-stationary orbit, comprising the following steps:

(a) transmitting, for communication purposes between transmitter ground station means on earth and said first and second satellites, at least two signal data streams having the same carrier frequency and different powers,

(b) using a first signal data stream having a higher power for communication between said transmitter ground station means and said geo-stationary satellite (S_1), and

(c) transmitting further signal data streams having a lower power by means of PN sequences which spread said further signal data streams within a length of said PN sequences for achieving said lower power to provide a power decoupling of communications between said transmitter ground station means and said geo-stationary first satellite when communicating between said transmitter ground station means and said second satellite or second satellites, whereby said power decoupling is effective even if said first and second satellites are in such positions relative to each other and to said transmitter ground station means that an interference region is formed by antenna cones of said ground station means.

4,985,707

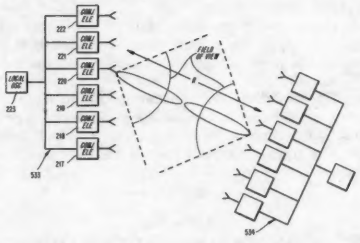
RETRODIRECTIVE ADAPTIVE LOOP FOR METEOR COMMUNICATIONS

Charles J. Schmidt, River Vale; Joseph Kadin, Florham Park, both of N.J., and S. Eugene Potent, McLean, Va., assignors to BroadCom, Inc., Mahwah, N.J.

Filed Jan. 9, 1989, Ser. No. 294,716

Int. Cl.[5] H01Q 1/00; H04B 7/00

U.S. Cl. 342—370 **22 Claims**



1. A communications system comprising:

a scattering medium having a stream of reflectors;

a first plurality of conjugate elements, each having a spatial servo loop for phase locking on to a pilot signal;

a second plurality of conjugate elements, each having a spatial servo loop for phase locking on to the pilot signal;

a first station having a first phased-array antenna including said first plurality of conjugate elements, capable of forming a first broad beamwidth and a first narrow beamwidth, with said first plurality of conjugate elements in view of said scattering medium;

means located at said first station and coupled to said first phased array antenna, for transmitting the pilot signal from said first phased array antenna using the first broad beamwidth;

at least a second station remotely located from said first station, having a second phased-array antenna having said second plurality of conjugate elements, capable of forming a second broad beamwidth and a second narrow beamwidth, with said second plurality of conjugate elements in common view of said scattering medium with said first phased-array antenna, wherein said second plurality of conjugate elements, responsive to receiving with the second broad beamwidth the pilot signal transmitted from said first phased-array antenna and reflected from said scattering medium, retransmit the pilot signal to said first station from said second phased-array antenna using the second narrow beamwidth, thereby transmitting a second retrodirective wavefront; and

wherein said first plurality of conjugate elements of said first phased-array antenna, located at said first station and responsive to receiving with the first broad beamwidth

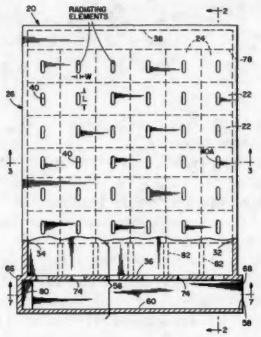
and, with said spatial servo loop, phase locking onto the pilot signal retransmitted from said second phased-array antenna and reflected from said scattering medium, retransmits the pilot signal to said second station, thereby transmitting a first retrodirective wavefront, and wherein said first phased-array antenna responsive to receiving the retransmitted pilot signal from said second phased-array antenna, forms the first narrow beamwidth focused at said scattering medium, and said second phased-array antenna responsive to receiving the retransmitted pilot signal from said first phased-array antenna forms the second narrow beamwidth focused at said scattering medium, wherein a free space oscillating loop using a zoom lens effect is established with said first phased-array antenna using the first narrow beamwidth and said second phased-array antenna using the second narrow beamwidth, focused in common view of said scattering medium, and data are transmitted between said first plurality of conjugate elements and said second plurality of conjugate elements.

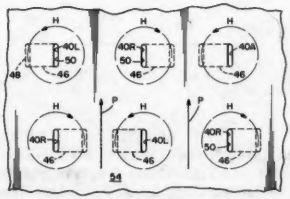
4,985,708

ARRAY ANTENNA WITH SLOT RADIATORS OFFSET BY INCLINATION TO ELIMINATE GRATING LOBES

Kenneth C. Kelly, Sherman Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 8, 1990, Ser. No. 476,999
Int. Cl.[5] H01Q *13/10*
U.S. Cl. 343—771 **20 Claims**





1. An antenna comprising:

a waveguide of rectangular cross section having two opposed broad walls and two opposed sidewalls extending lengthwise along the waveguide in a direction of propagation of electromagnetic power in the waveguide, the two broad walls being spaced apart and joined to the two sidewalls to define an enclosed space, the broad walls having a width which is many times greater than a height of the sidewalls to support a higher-order mode of transverse electric wave of microwave electromagnetic energy;

a set of radiating elements disposed in a first of said broad walls and arranged along said first broad wall in rows and columns, the columns being parallel to said sidewalls, a peak value of the electric field of said higher order mode of transverse electric wave being located at each of said columns; and

wherein each of said radiating elements has an input port, disposed on an inner surface of said first broad wall of said waveguide communicating with said enclosed space, and an output port on an outer surface of said waveguide opposite said inner surface;

in each of said columns, the output port of each of said radiating elements is located on a center line of the column, and the input port of each of said radiating elements is located at an offset position displaced from the column center line;

in each of said columns, successive ones of said offset positions alternate in displacement from said column center line by displacement along said inner surface to a right side and to a left side of said column center line to provide a position array of alternating offset positions; and,

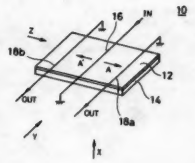
in successive ones of said columns, the position arrays are reversed to provide for a row of radiating elements wherein the input ports of a succession of said radiating elements alternate in their offset positions to attain a coupling of magnetic field components of said wave to all the radiating elements of said waveguide to output radiating signals from the respective radiating elements having a common polarization and phase.

4,985,709

MAGNETOSTATIC WAVE DEVICE

Toshio Nishikawa; Hiroaki Tanaka, and Satoru Shinmura, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jun. 12, 1989, Ser. No. 365,073
Claims priority, application Japan, Jun. 24, 1988, 63-157826
Int. Cl.[5] H01Q *1/00*
U.S. Cl. 343—787 **13 Claims**



1. A magnetostatic wave device comprising:

a ferrimagnetic base material;

a first coupling antenna comprising an input coupling antenna formed on one principal surface of said ferrimagnetic base material for propagating a magnetostatic wave in opposite directions therefrom;

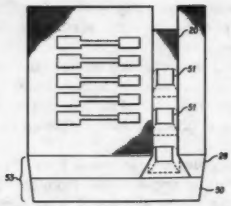
a second coupling antenna comprising at least first and second output coupling antennas formed on opposite sides of said input coupling antenna, on one principal surface of said ferrimagnetic base material, said output coupling antennas being positioned to receive said magnetostatic wave propagated in opposite directions from the input coupling antenna.

4,985,710

BUTTABLE SUBUNITS FOR PAGEWIDTH "ROOFSHOOTER" PRINTHEADS

Donald J. Drake, Rochester, and William G. Hawkins, Webster, both of N.Y., assignors to Xerox Corporation, New York, N.Y.

Filed Nov. 29, 1989, Ser. No. 442,641
Int. Cl.[5] B41J 2/05
U.S. Cl. 346—1.1 20 Claims



1. A method for fabricating a printhead subunit for a butted array of printhead subunits for use in a thermal ink jet printing device comprising the steps of:

(a) bonding a heater substrate having an architecture including an array of heating elements and an ink feed slot to a secondary substrate having a series of spaced feed hole openings to form a combined substrate in which said series of spaced feed hole openings communicate with said ink feed slot; and

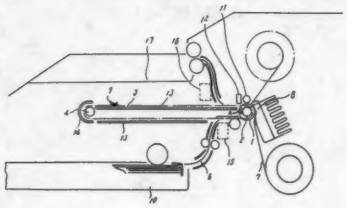
(b) dicing said combined substrate through said ink feed slot to form said subunit.

4,985,711

THERMAL PRINTER WITH A TENSION ROLLER

Hisashi Nakamura, Fukuyama, and Hiroshi Fukumoto, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 14, 1990, Ser. No. 480,142
Claims priority, application Japan, Feb. 16, 1989, 1-38835
Int. Cl.[5] G01D 15/10
U.S. Cl. 346—76 PH 6 Claims



1. A thermal printer comprising:

an ink sheet for supplying an ink;

a platen roller for keeping said ink sheet in close contact with a sheet-type recording paper;

a first pulley attached to said platen roller;

a timing belt wound around said first pulley and capable of running in the same direction as the direction of rotation of said platen roller at a speed lower than the peripheral speed of said platen roller, said timing belt having a circumferential length greater than the length of said recording paper;

a second pulley for stretching said timing belt;

a clamper connected to said timing belt for clamping an end of said recording paper;

a thermal head for pressing said recording paper and said ink sheet against said platen roller to thermally transfer said ink from said ink sheet to said recording paper; and

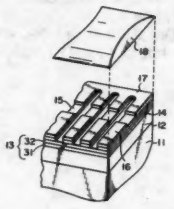
a first tension roller rotatable at a peripheral speed higher than the peripheral speed of said platen roller to apply tension to said recording paper after the thermal transfer of said ink.

4,985,712

THERMAL HEAD

Masaru Nikaido, Miura; Katsuhisa Homma, Kawasaki, and Tadayoshi Kinoshita, Machida, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 26, 1989, Ser. No. 426,865
Claims priority, application Japan, Oct. 31, 1988, 63-272943
Int. Cl.[5] G01D 15/10
U.S. Cl. 346—76 PH 9 Claims



1. A thermal head comprising:

a high-resistance substrate;

a heat-generating resistive layer formed on the high-resistance substrate;

electrode layers formed on the high-resistance substrate so as to be electrically connected to the heat-generating resistive layer; and

a protective layer formed to cover at least a heat-generating portion of the heat-generating resistive layer,

wherein the protective layer comprises a compound containing Si, O, N, ZR and a metal M (wherein M is at least one metal selected from the group consisting of Mg, and Y).

4,985,713

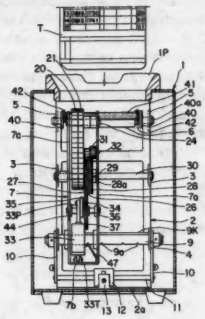
TIME RECORDER HAVING BELT PRINTING TYPES

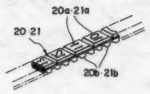
Hidemi Komine, and Yoshio Miyagi, both of Yokohama, Japan, assignors to Amano Corporation, Yokohama, Japan

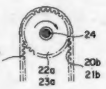
Filed Nov. 28, 1989, Ser. No. 442,987
Int. Cl.[5] G01D 15/20
U.S. Cl. 346—82 2 Claims

1. A timer recorder having belt printing types, characterized in that a printing portion comprises a plurality of hour-use belt printing types arranged in a row on a surface of a first belt and gradually fed by hour unit in accordance with a time signal, a plurality of minute-use belt printing types arranged in a row on a surface of a second belt and gradually fed by minute unit in accordance with a time signal, and urging and rotating means for urging printing typefaces of said printing types arranged on

said first and second belts against a printing surface of a time card inserted into the time recorder and rotating the same in







order to effect a printing on the printing surface of said time card.

4,985,714

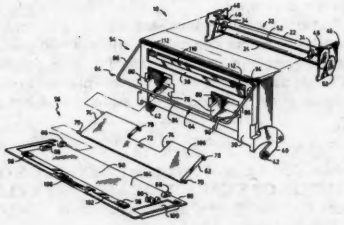
FILM DISPENSER WITH ARTICULATED CATCHER

Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 22, 1990, Ser. No. 468,238

Int. Cl.[5] G01D *15/00*

U.S. Cl. 346—107 R **10 Claims**



1. A dispenser of film units delivered by film processing apparatus enclosed in a housing, the dispenser comprising:

a sidewall of said housing and an exit slot in the sidewall, the exit slot serving for discharge of the film units from the housing;

ejection means disposed in said housing for ejecting individual ones of the film units from said housing by said slot;

a catcher having retracted and extended states relative to said housing, said catcher having a tray and being mounted to said housing outside said sidewall, said catcher being extendible from said housing to said extended state for catching individual ones of the film units on said tray upon passing of the film units via said slot, said catcher closing said tray against said sidewall upon a retraction of said catcher to said retracted state; and

wherein said catcher further comprises a spring biased in all positions of said catcher to urge said catcher into said retracted state; and

said ejecting means urges individual ones of said film units against said tray with sufficient force to overcome a retractive force of said spring and to deflect said tray away from said sidewall for supporting individual ones of said film units, deflection of said tray placing said catcher in said extended state, said tray engaging with an individual one of said film units for maintaining said catcher in said extended state, said spring automatically retracting said catcher upon an emptying of said tray of film units.

4,985,715

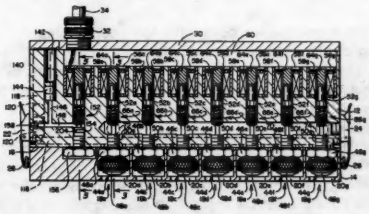
MARKER ASSEMBLY FOR SPRAY MARKING DOT MATRIX CHARACTERS AND METHOD OF FABRICATION THEREOF

David L. Cyphert, Canal Winchester, and John A. Robertson, Chillicothe, both of Ohio, assignors to Telesis Controls Corporation, Chillicothe, Ohio

Filed Mar. 22, 1990, Ser. No. 497,507

Int. Cl.[5] B41J *2/07*

U.S. Cl. 346—140 R **34 Claims**



1. A marker assembly actuable for spray marking a surface with marking fluid, comprising:

a housing extending from a front surface to a rearward portion;

a channel within said housing having a given axis and extending from said front surface to said rearward portion;

a sleeve fixed within said channel and extending into said rearward portion coil retaining cavity;

an excitation coil positioned over said sleeve at said rearward portion;

a pole piece fixed within said sleeve and having a forward surface located a predetermined distance from said front surface;

a fluid cap removably mounted upon said housing front surface and having a passageway coaxial with said given axis extending to an opening within a valve seat;

a valve stem having a tip seatable in closing relationship against said valve seat, said stem being reciprocally movable and extending within said channel and said sleeve to an armature retaining portion;

a spring within said channel for bearing said valve stem into said closing relationship;

an armature fixed to said valve stem armature retaining portion, slideably movable therewith within said sleeve and having a rearwardly disposed surface positioned a predetermied fixed gap distance from said pole piece forward surface when said valve stem is positioned in said closing relationship;

a fluid input for supplying said fluid to said chamber frame fluid supply;

control means for selectively energizing said excitation coil

to effect retraction of said armature to the extent of said fixed gap.

4,985,716

APPARATUS FOR GENERATING IONS USING LOW SIGNAL VOLTAGE

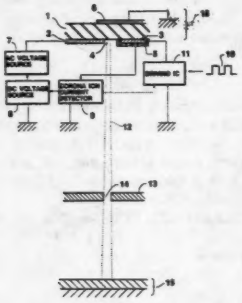
Yasuo Hosaka, Tokyo, and Tadayoshi Ohno, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 13, 1989, Ser. No. 434,424

Claims priority, application Japan, Nov. 10, 1988, 63-282500

Int. Cl.[5] G01D *15/06*

U.S. Cl. 346—159 **10 Claims**



1. An apparatus for generating ions, comprising:

first electrode means for generating ions;

first voltage source means for applying to the first electrode means a first voltage slightly less than a critical voltage for constant ion generation;

second electrode means for starting ion generation by the first electrode means, which is located in a vicinity of the first electrode means with a gap therebetween; and

second voltage source means for applying to the second electrode means a second voltage significantly less than the first voltage, but having such an amplitude that a total of the first and the second voltages exceeds the critical voltage, such that ion generation by the first electrode means takes place only while the second voltage is being applied to the second electrode means.

4,985,717

MOS MEMORY CELL WITH EXPONENTIALLY-PROFILED DOPING AND OFFSET FLOATING GATE TUNNEL OXIDATION

Sheldon Aronowitz, San Jose; Donald D. Forsythe, Palo Alto; George P. Walker, Capitola, and Bhaskar V. S. Gadepally, San Jose, all of Calif., assignors to National Semiconductor, San Diego, Calif.

Filed Feb. 21, 1989, Ser. No. 313,648

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.5 **9 Claims**

4. A semiconductor memory device, including

a semiconductor substrate of a first conductivity type;

first and second regions of a second conductivity type formed in a surface of said semiconductor substrate; and

said first and second regions being spaced apart in a first direction, said first direction corresponding to the X axis of a set of three orthogonal axes, X, Y, and Z;

a channel region formed in said substrate and extending along said first direction between said first and second regions, said channel region having a length measured between said first and second regions along said X axis, a depth measured in a second direction extending from the top toward the bottom surface of said semiconductor substrate along said Y axis, and a width measured in a third direction in said top surface along said Z axis;

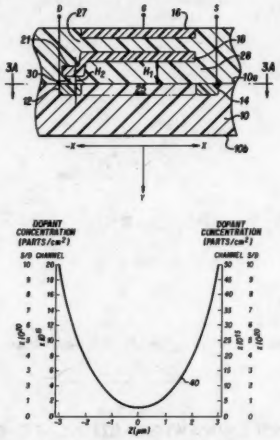
a control gate formed on said substrate over said channel region;

said channel region including first conductivity-determining dopant impurities in said semiconductor substrate and having a concentration profile which increases in a direction parallel to said Z axis from an initial point on a line substantially widthwise-centered in said channel region;

said first and second regions each including second conductivity-determining dopant impurities in said semiconductor substrate and having a concentration profile which increases exponentially in a direction parallel to said Z axis from an initial point on an extension of said line;

a control gate formed on said substrate over said channel region;

a floating gate formed in said substrate between said control gate and said channel region, said floating gate having a tunnel portion in the vicinity of said first region, said



tunnel portion extending over said first region and a portion of said channel region abutting said first region;

said channel region including first conductivity-determining dopant impurities in said semiconductor substrate and having a concentration profile which increases exponentially in a direction parallel to said Z axis from an initial point on a line substantially widthwise-centered in said channel region; and

said first and second regions each including second conductivity-determining dopant impurities in said semiconductor substrate and having a concentration profile which increases exponentially in a direction parallel to said Z axis from an initial point on an extension of said line.

4,985,718

SEMICONDUCTOR MEMORY DEVICE OF ONE TRANSISTOR-ONE CAPACITOR MEMORY CELL TYPE

Toshiyuki Ishijima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 20, 1989, Ser. No. 438,125

Claims priority, application Japan, Nov. 18, 1988, 63-291592; Mar. 7, 1989, 1-55345

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.6 **11 Claims**

1. A semiconductor memory device having a plurality of semiconductor memory cells of one transistor - one capacitor type comprising:

a semiconductor substrate of a first conductivity type having a major surface, said substrate including first and second transistor forming portions;

first and second impurity regions of a second conductivity

type opposite to said first conductivity type formed in said major surface of said first transistor forming portion;

third and fourth impurity regions of said second conductivity type formed in said major surface of said second transistor forming portion;

a first insulating layer formed on said first to fourth impurity regions;

a first gate insulating film formed on said major surface between said first and second impurity regions;

a second gate insulating film formed on said major surface between said third and fourth impurity regions;

a first gate electrode formed on said first gate insulating film and covered by an insulating film;

a second gate electrode formed on said second gate insulating film and covered by an insulating film;

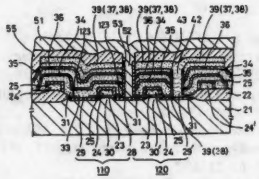
a first capacitor electrode electrically connected to said second impurity region and formed on said first and second transistor forming portions;

a first dielectric film formed on said first capacitor electrode;

a common capacitor electrode formed on said first dielectric film;

a second dielectric film formed on said common electrode;

a second capacitor electrode electrically connected to said fourth impurity region, formed on said second dielectric film and on said first and second transistor forming portions;



an inter-ply insulating layer formed on said second capacitor electrode; and

a bit line formed on said inter-ply insulating layer and electrically connected to said first and third impurity regions;

whereby a first semiconductor memory cell is constructed by a first switching transistor and a first storage capacitor in which said first switching transistor is constituted of said first impurity region serving as one of source and drain regions, said second impurity region serving as the other of source and drain regions, said first gate insulating film and said first gate electrode, and in which said first storage capacitor is constituted by said first capacitor electrode, said first dielectric film and said common capacitor electrode, and whereby a second semiconductor memory cell is constructed by a second switching transistor and a second storage capacitor in which said second switching transistor is constituted of said third impurity region serving as one of source and drain regions, said fourth impurity region serving as the other of source and drain regions, said second gate insulating film and said second gate electrode, and in which said second storage capacitor is constituted by said second capacitor electrode, said second dielectric film and said common capacitor electrode.

4,985,719

APPARATUS FOR PREVENTING STATIC ELECTRICITY OF PLASTIC LENS

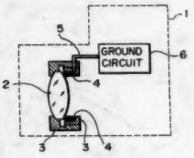
Ikuya Tsurukawa, Yokohama, and Kosaku Sawabe, Ichikawa, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 18, 1990, Ser. No. 510,564

Claims priority, application Japan, Apr. 20, 1989, 1-46693; Feb. 22, 1990, 2-17171

Int. Cl.[5] G03B *17/00*

U.S. Cl. 354—174 **10 Claims**



1. An apparatus for preventing static electricity of a plastic lens, comprising:

the plastic lens coated with a transparent conductive coating; and

a conductive member for electrically connecting said coating of the plastic lens to an electric circuit within a camera such that static electricity of said plastic lens is guided to said electric circuit.

4,985,720

METHOD OF CONTROLLING TEMPERATURE FOR DRYING PHOTOSENSITIVE MATERIAL

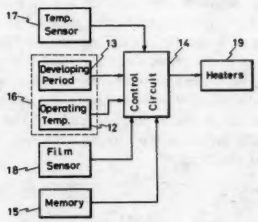
Yoshihiro Masuda; Takashi Yagi, and Eiji Nishimura, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jul. 15, 1988, Ser. No. 219,323

Claims priority, application Japan, Jul. 15, 1987, 62-174920

Int. Cl.[5] G03D *3/00*; F26B *21/00*

U.S. Cl. 354—299 **26 Claims**



1. A method of controlling the temperature of a drying section to reduce the total energy consumption of said drying section, said method comprising the steps of:

inputting a current operating mode of a machine for processing photosensitive material;

drying photosensitive material in a drying section of said machine at an operating temperature; and

in response to said inputting step, maintaining said drying section at a standby temperature, said standby temperature being functionally related to (a) said current operating mode of said machine and (b) the ability of said drying section to increase its temperature from said standby temperature to said operating temperature.

4,985,721

FILM CHANGE BAG

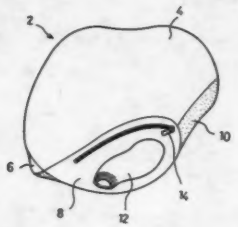
Byungmoon Moon, Seoul, Rep. of Korea, assignor to New Tech Co., Ltd., Seoul, Rep. of Korea

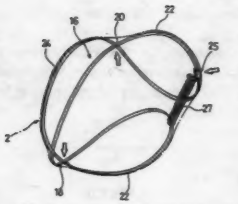
Filed Jul. 24, 1989, Ser. No. 384,734

Claims priority, application Rep. of Korea, Jul. 23, 1988, 88-11885[U]; Jun. 9, 1989, 89-7992[U]

Int. Cl.[5] G03B *17/56*

U.S. Cl. 354—308 **17 Claims**





13. A film change bag comprising:

a bag of flexible material;

an opening in the bag through which one may insert an object and which is closable to be light-tight;

a pair of opposed openings in the bag through which a user may put his hands for manipulating film or the like;

an endless loop of elastic ribbon within the bag; and

hinge pins between segments of the ribbon dividing the ribbon into three edge-to-edge smaller endless loops for pivoting of adjacent looped segments of the ribbon relative to each other between a folded position where the smaller loops are approximately in a single plane and an unfolded condition where none of the three smaller loops are in a single plane so that each of the smaller loops torsionally twists when moved between the folded and unfolded positions.

4,985,722

APPARATUS FOR COATING A PHOTO-RESIST FILM AND/OR DEVELOPING IT AFTER BEING EXPOSED

Mitsuru Ushijima, Tokyo, and Masami Akimoto, Kikuchi, both of Japan, assignors to Tokyo Electron Limited, Tokyo and Tel Kyushu Limited, Kumamoto, both of, Japan

Filed Feb. 10, 1989, Ser. No. 308,470

Claims priority, application Japan, Feb. 12, 1988, 63-30219

Int. Cl.[5] G03D *5/04*; B65G *25/00*

U.S. Cl. 354—319 **11 Claims**

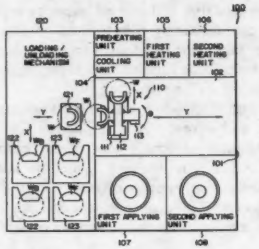
1. A photo-resist processing apparatus comprising:

a passage provided such that it extends in a predetermined direction to allow conveyance of a substrate to be treated;

a plurality of treating units necessary for photo-resist processing, these units being provided along said passage;

at least one conveying means for conveying the substrate along said passage in a selective manner according to a predetermined program;

at least two handling means provided on said at least one conveying means for loading the substrate into the treating unit and for unloading the substrate from the treating unit, said at least two handling means being transferred together along said passage by said at least one conveying



means and being movable independently of each other on said at least one conveying means for handling the substrate;

controlling means for selecting said plurality of treating units in any combination and for controlling operations of said at least one conveying means and said at least two handling means so that the substrate undergoes predetermined treatments at the selected units in any sequence.

4,985,723

PHOTOGRAPHIC CAMERA

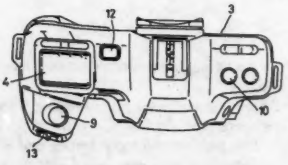
Takeshi Egawa; Masaaki Nakai; Yasuo Nakanishi; Toshihiko Ishimura; Shinichi Nishimura; Sadafusa Tsuji, and Kenji Ishibashi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 16, 1989, Ser. No. 352,191

Claims priority, application Japan, May 16, 1988, 63-119848; May 16, 1988, 63-213192

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—400 **9 Claims**



1. A photographic camera comprising:

focus condition detection means for detecting focus conduction of a photographic lens relative to a photographic subject;

exposure control means capable of selectively providing a plurality of exposure control modes;

exposure mode selecting means for selecting an exposure control mode from the plurality of exposure control modes;

focus control means for selectively providing an autofocus mode where focusing is effected automatically based on the focus condition detected by the focus condition detection means and a manual focus mode where a focusing is effected manually;

focus mode selecting means for switching over between the autofocus mode and the manual focus mode; and

switching means for switching said focus control means to

the autofocus mode in response to a predetermined exposure mode selecting operation by said exposure mode selecting means when the manual focus mode is currently selected.

4,985,724

AUTOMATIC FOCUS/EXPOSURE OPERATION APPARATUS FOR CAMERA

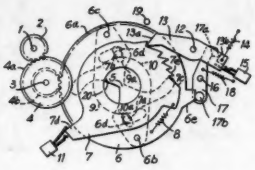
Kazuo Akimoto; Toshiaki Hirai, and Miyoshi Tanikawa, all of Chiba, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1989, Ser. No. 394,596

Claims priority, application Japan, Aug. 17, 1988, 63-204227

Int. Cl.[5] G03B *3/00, 1/18, 17/38*

U.S. Cl. 354—400 **14 Claims**



2. Apparatus for performing an automatic focus/exposure operation for a camera, comprising:

a drive member driven by a motor;

distance member means for driving a lens focussing mechanism during a lens focussing operation, in correspondence with movement of said drive member in a first direction;

retaining pawl means for engaging said distance member means to prevent reverse movement of said distance member means upon completion of said lens focussing operation;

blade opening/closing means for opening blades during an exposure operation when said drive member moves in a second direction which is opposite to said first direction of said focussing operation, said blade opening/closing means shifting said exposure operation quickly upon completion of said lens focussing operation;

detection means for detecting a phase difference between said distance member means and said retaining pawl means upon completion of said lens focussing operation, when said distance member means is engaged by said retaining pawl means; and

control means for correction the extent of operation of said blade opening/closing means by said drive member in response to said phase difference detected by said detection means.

4,985,725

AUTO-FLASH PHOTOGRAPHING SYSTEM

Yoshio Serikawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 235,840, Aug. 19, 1988, Pat. No. 4,897,684, which is a continuation of Ser. No. 882,354, Jul. 7, 1986, abandoned. This application Aug. 7, 1989, Ser. No. 390,516

Claims priority, application Japan, Jul. 6, 1985, 60-102448[U]; Jul. 18, 1985, 60-108898[U]; Jul. 19, 1985, 60-109762[U]; Aug. 12, 1985, 60-175924; Aug. 23, 1985, 60-183931

Int. Cl.[5] G03B *15/05;* **H05B** *41/36*

U.S. Cl. 354—416 **1 Claim**

1. An automatic flashing system, comprising:

flash emitting means for emitting a flash, including a flash lamp and a capacitor which is connected to said flash lamp for supplying energy for causing said flash lamp to emit a flash;

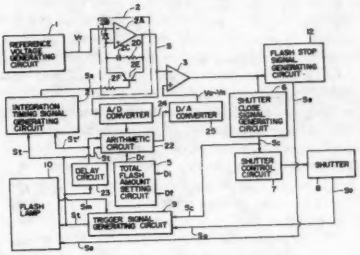
detecting means for detecting light reflecting from a subject of interest;

setting means for setting a reference value corresponding to an optimal exposure condition, said reference value indicating an amount of light under the optimal exposure condition;

comparing means responsive to said detecting means and said setting means for comparing a detection signal supplied from said detecting means with a reference signal supplied from said setting means;

triggering means responsive to said comparing means for triggering said flash emitting means at least one more if an output from said comparing means indicates that the light detected by said detecting means has not reached said reference value by a first triggering of said flash emitting means; and

means for renewing said reference value by subtracting a detected amount of light detected by said detecting means each time when said flash emitting means emits a flash when triggered by said triggering means.



4,985,726

PHOTOMETRIC DEVICE FOR CAMERA

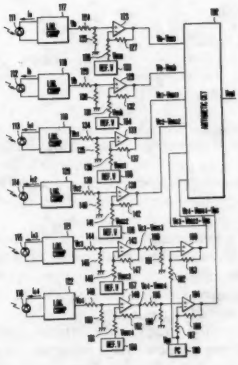
Kazuo Fujibayashi; Shingo Hayakawa, and Shuchi Kiyohara, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 426,488, Oct. 23, 1989, abandoned, which is a continuation of Ser. No. 120,542, Nov. 13, 1987, abandoned. This application Mar. 22, 1990, Ser. No. 501,432

Claims priority, application Japan, Nov. 19, 1986, 61-274152; Nov. 25, 1986, 61-278645

Int. Cl.[5] G03B *1/99, 7/20*

U.S. Cl. 354—432 **25 Claims**



1. A photometric device for a single-lens reflex camera having a viewfinder, a pentagonal prism, and an interchangeable lens, said device comprising:

(a) light receiving means having a middle area photosensor which measures the luminance of the middle area of a photographing field and a plurality of peripheral area photosensors which measure the luminance of peripheral areas of the field, said light receiving means producing luminance information from each of the peripheral areas, said photosensors being disposed at a position off of an optical axis of said viewfinder wherein said middle area photosensor in said light receiving means is eccentrically deviated from the optical axis of said viewfinder;

(b) a photometric optical system which includes a focusing screen, and an image forming lens arranged to guide an image of a photograph object formed on said focusing screen, said optical system being disposed in the rear of an exit face of said pentagonal prism in an eccentric position deviating from the optical axis of said viewfinder;

(c) computing means for computing a measured light value on the basis of information on the luminance of each of the areas of said light receiving means;

(d) information receiving means for receiving, from the interchangeable lens, information pertaining to an exit pupil position of said interchangeable lens; and

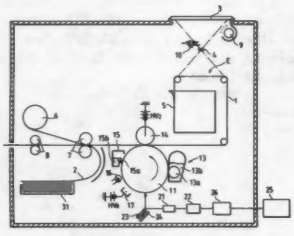
(e) correction means for supplying said computing means with correction information for correcting the luminance information obtained from a specific one of the peripheral areas on the basis of the information obtained by said information receiving means, the correction information being based on the fact that the middle area of said light receiving means is eccentrically deviated from the optical axis of said viewfinder.

4,985,727

IMAGE RECORDING APPARATUS AND METHOD FOR RECORDING IMAGE

Jun Sakai, and Mitsuru Ohta, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 9, 1989, Ser. No. 404,775
Claims priority, application Japan, Sep. 12, 1988, 63-277852
Int. Cl.[5] G03B 27/32
U.S. Cl. 355—27 8 Claims



1. An image recording apparatus for recording an output image on a sheet medium, the output image corresponding to an image of an original, the apparatus using a photosensitive pressure sensitive recording medium having a surface which carries microcapsules encapsulating therein a chromogenic material, the apparatus comprising:

a first exposure unit for exposing the photosensitive pressure sensitive recording medium to light for forming a latent image thereon corresponding to the image of the original;

a second exposure unit for electrostatically forming a developer particle image;

a transferring means for electrostatically transferring the developer particle image onto the photosensitive pressure sensitive recording medium carrying the latent image thereon; and

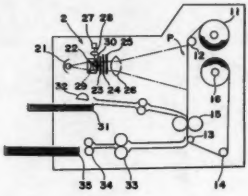
a pressure developing unit disposed downstream of the transferring means for generating a chromogenic reaction between the chromogenic material and the developer particles to provide the output image on the sheet medium. wherein the developer particle image corresponds to the latent image on the photosensitive pressure sensitive recording medium.

4,985,728

EXPOSURE METHOD FOR FORMING LATENT IMAGES

Kunio Ohashi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 27, 1989, Ser. No. 413,218
Claims priority, application Japan, Sep. 29, 1988, 63-244970
Int. Cl.[5] G03B 27/62
U.S. Cl. 355—77 6 Claims



1. A method for forming latent images on a media sheet which is coated with at least

first micro-capsules which contain a first photocurable material, which is curable by light having a first wave length range, and a first color developing dye, and

second micro-capsules which contain a second photocurable material, which is curable by light having a second wave length range which is different from said first wave length range,

wherein the first wave length range partially overlaps the second wave length range,

comprising the steps of:

(a) exposing the media sheet to light having the first wave length range,

(b) stopping the exposure of the media to the light having the first wave length range; and

(c) after an effective amount of time has passed to supply oxygen to the micro-capsules exposing the media sheet to light having the second wave length range.

4,985,729

CONTROL SYSTEM FOR REPRODUCTION MACHINES PROVIDING AN EXTENDED ALMOST JAM INTERVAL AND SHUTDOWN DELAY

Barbara A. Sampath; James F. Matysek, both of Fairport, and Thomas N. Taylor, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 12, 1988, Ser. No. 246,725
Int. Cl.[5] G03G 21/00
U.S. Cl. 355—206 7 Claims

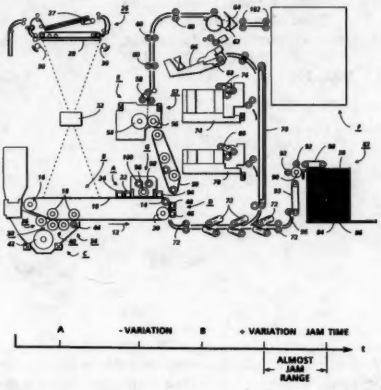
1. In a reproduction machine having plural discretely operating copy producing components synchronously operable in timed sequence with one another to produce copies, the combination of:

(a) first fault timing means for tolling a preset timed interval delimiting the copy producing cycle of at least one of said components of said machine,

said first fault timing means on failure of said one component to complete its copy producing cycle within said preset timed interval enabling stopping said machine;

(b) second fault timing means adapted to intervene and delay stopping of said machine by said first fault timing means for a relatively short almost jam interval, said almost jam interval providing extra time for said one component to

complete its copy producing cycle in an attempt to avoid the need to stop said machine,



said second fault timing means on failure of said one component to complete its copy producing cycle within said almost jam interval enabling stopping said machine.

4,985,730

METHOD OF DEELECTRIFICATION IN AN ELECTROPHOTOGRAPHIC APPARATUS

Hiroki Ohba, Yokohama; Makoto Koshi, Kawasaki, and Norihiro Kumasaka, Fukushima, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 22, 1989, Ser. No. 396,877

Claims priority, application Japan, Aug. 29, 1988, 63-214391; Aug. 31, 1988, 63-217700

Int. Cl.[5] G03G *21/00, 15/02*

U.S. Cl. 355—208 **9 Claims**

1. A method of controlling an optical-deelectrification in an electrophotographic recording apparatus having a rotatable photosensitive member, said method comprising the steps of:

electrifying said photosensitive member;

depositing an electrostatic latent image on said photosensitive member;

developing said latent image;

transferring said image to printing media;

delectrifying said photosensitive member;

defining a passage of said printing media, wherein said step of deelectrifying said photosensitive member is by an optical deelectrification unit located at a position opposite said photosensitive member with respect to said passage of printing media; and

irradiating an optical deelectrification light from said optical deelectrification unit to said photosensitive member only when said printing media interrupts an optical path of said deelectrification light toward said photosensitive member.

4,985,731

IMAGE-FORMING APPARATUS

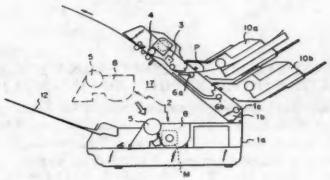
Shigeki Sakakura, Tama, and Akihiro Komuro, Komae, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 24, 1989, Ser. No. 356,364

Claims priority, application Japan, May 25, 1988, 63-129364; May 26, 1988, 63-129025

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—210 **17 Claims**



10. An image-forming apparatus comprising:

a housing having an upper frame and a lower frame pivotally connected at one end to the upper frame;

a fuser unit mounted in the upper frame and having a heat roller;

at least one hopper detachably connected to the upper frame and having a pick-up roller;

a regist roller corresponding to each at least one hopper and being disposed within the upper frame;

a process cartridge removably mounted in the lower frame and including a developer unit having a photoconductive drum;

a transfer-charger mounted in the upper frame in proximity to the photoconductive drum;

at least one guide roller mounted in the upper frame;

a drive motor, disposed in the lower frame, for driving the various rollers and the photoconductive drum; and

a transmission having a first portion disposed in the upper frame and being operatively connected to the various rollers of the upper frame, and a second portion disposed in the lower frame coupled to the motor and disconnectable from the first portion when the upper and lower frames are pivoted relative to each other.

4,985,732

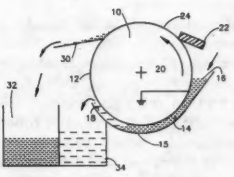
ELECTROSTATIC SEPARATOR

Benzion Landa, Edmonton, Canada; Shabtai Ezuz, Moshav Beit Hannan, Israel; Jakob Karin, Ramat Gan, Israel, and Paul Fenster, Petach Tikva, Israel, assignors to Spectrum Sciences B.V., Rotterdam, Netherlands

Filed Mar. 8, 1989, Ser. No. 320,614

Int. Cl.[5] G03G *15/10*

U.S. Cl. 355—256 **27 Claims**



1. Electrostatic separator apparatus for separation of particles from a liquid comprising:

a drum having a drum surface;
means for supplying a particle dispersion comprising particles dispersed in a liquid to the drum surface;
electrostatic means for causing at least some of the particles to adhere to the drum surface without forming an image thereon;
resilient blade means, downstream of the electrostatic means for operative engagement with the drum surface for retaining a layer of particle rich material on the drum surface; and
layer removal means for layerwise removing substantially all of said layer from the drum surface.

4,985,733

IMAGE FIXING UNIT FOR USE IN WET-TYPE ELECTROPHOTOGRAPHIC COPYING MACHINE

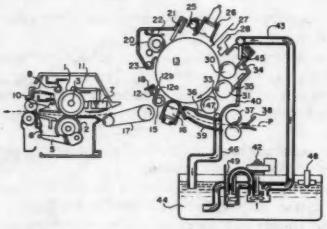
Tsuneo Kurotori, Tokyo; Manabu Mochizuki; Kenzo Ariyama, both of Yokohama; Ichiro Tsurusoka; Hiroaki Takenouchi, both of Tokyo, and Katsuhiro Echigo, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 331,649

Claims priority, application Japan, Apr. 2, 1988, 63-82624; Jun. 20, 1988, 63-151575; Jan. 6, 1989, 64-332[U]; Jan. 12, 1989, 1-2422; Jan. 13, 1989, 1-2932; Jan. 17, 1989, 1-8230

Int. Cl.[5] G03G *15/10, 15/20*

U.S. Cl. 355—282 **9 Claims**



1. An image fixing unit for a wet-type electrophotographic copying machine capable of forming a latent electrostatic image on a photoconductor element, developing said latent electrostatic image to a visible toner image by a developer comprising a carrier liquid and toner particles and transferring said visible toner image to a transfer sheet, comprising:
(a) a non-thermal carrier liquid content reduction means for reducing the content of said carrier liquid in said developer deposited on said transfer sheet without application of heat thereto, and
(b) a thermal image fixing means for fixing said toner image to said transfer sheet by directly heating said toner image formed on said transfer sheet after the reduction of the content of said carrier liquid in said developer deposited on said transfer sheet by said non-thermal carrier liquid content reduction means;
wherein said non-thermal carrier liquid content reduction means comprises:
at least one elastic blotter roller capable of absorbing said carrier liquid; and
at least one back-up roller for bringing said transfer sheet into contact with said elastic blotter roller, with the toner image bearing side thereof being in contact with said elastic blotter roller, and said back-up roller being rotatable in contact with said elastic blotter roller;
wherein said back-up roller is an elastic roller capable of forming a nip between said elastic blotter roller and said back-up roller.

4,985,734

WASTE TONER COLLECTING CONTAINER PROVIDED WITH CORONA CHARGER

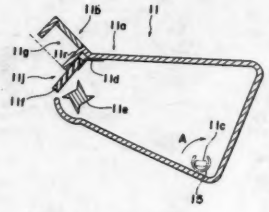
Iwakazu Honda, and Yuhi Yui, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 18, 1989, Ser. No. 353,492

Claims priority, application Japan, May 20, 1988, 63-124199

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—298 **6 Claims**



1. A waste toner collecting container for use in an electrophotographic arrangement having a photosensitive member, said waste toner collecting container comprising a disposable, one-piece, unitary container divided into a waste toner collecting box and a charger case, said charger case having a corona charge line for charging a photosensitive surface of the photosensitive member and aid waste toner collecting box receiving residual toner scraped off a photosensitive surface of a photosensitive member, said one-piece container with the waste toner collecting box and the charger case being readily removable from the electrophotographic arrangement and being replaceable with a new one-piece container after use thereof whereby cleaning of the corona charger line is avoided, said waste toner collecting container having fitting portions extending outwardly from rear lower portions of opposite side walls of the waste toner collecting box, said fitting portions being detachably mounted in a corresponding support member provided at a side of the electrophotographic arrangement when said one-piece container is received in the electrophotographic arrangement.

4,985,735

ELECTRIC DRIVE WITH MANUAL DOUBLER

Alexandr P. Odnoral, ulitsa Krasny Oktyabr, 3, kv. 34, Moskovskaya oblast, Dedovsk; Nikolai S. Tolmachev, ulitsa Lenina, 1, kv. 211, and Vladimir A. Tjutkin, ulitsa Lenina, 13, kv. 31, both of Moskovskaya oblast, Istra, all of U.S.S.R.

PCT No. PCT/SU88/00096, § 371 Date Jan. 10, 1990, § 102(e) Date Jan. 10, 1990, PCT Pub. No. WO89/10213, PCT Pub. Date Nov. 2, 1989

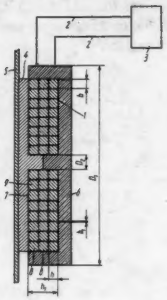
PCT Filed Apr. 22, 1988, Ser. No. 449,879

Int. Cl.[5] H01F *7/06, 7/20*; B08B *7/02*; B06B *1/04*

U.S. Cl. 335—299 **1 Claim**

1. An apparatus for cleaning surface from substances adhered thereto comprising an electromagnet coil (1), a source (3) of pulse current connected to the electromagnet coil (1), a paramagnetic plate (4) from a highly electroconductive material arranged between the surface (5) being cleaned and end face of the electromagnet coil (1), characterized in that the electromagnet coil (1) is multilayer, the number n of layers (8) ranging from two to five, each layer (8) having the form of a helical current conducting bar (7) of rectangular cross section, the layers (8) of the electromagnet coil (1) resting in parallel planes and connected in an aiding connection, the number W of coil turns (9) in each layer (8) for a two-layer electromagnet coil (1) ranging from $0.4W_1$ to $1.1W_1$, whereas the height h of the current-conducting bar (7) ranges from Δ to 1.5Δ, for a three-layer electromagnet coil (1) the number W of coils (9) in each layer (8) ranging from $0.35W_1$ to $0.9W_1$, whereas the height h of the current-conducting bar (7) ranges within from

0.8Δ to Δ, for a four-layer electromagnet coil (1) the number W of turns (9) in each layer (8) ranging from $0.32W_1$ to $0.75W_1$, whereas the height h of the current-conducting bar (7) ranges from 0.75 Δ to 0.9 Δ, and for a five-layer electromagnet coil (1) the number W of turns (9) in each layer (8) ranging from



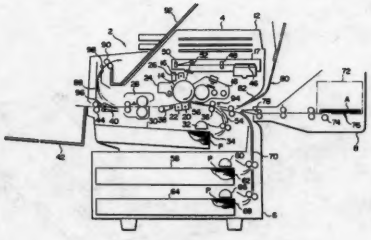
$0.3W_1$ to $0.65W_1$, whereas the height h of the current-conducting bar (7) is within a range from 0.7Δ to 0.8 Δ, where W_1 is the optimum number of turns (9), and Δ is the equivalent depth of penetration of the magnetic field into the metal of the electromagnet coil (1).

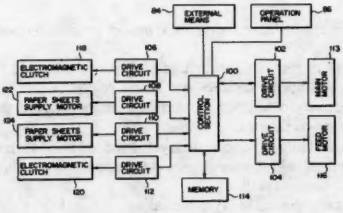
4,985,736

IMAGE FORMING APPARATUS

Hisaaki Kawano, Kawasaki, and Yasufumi Tanimoto, Fujisawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 27, 1988, Ser. No. 224,721
Claims priority, application Japan, Jul. 31, 1987, 62-191570
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—311 **6 Claims**





1. An image forming apparatus comprising:

image-forming means for continuously forming images on sheet of paper;

first paper-feeding means for feeding sheet of paper to said image-forming means, over a first paper-feeding distance;

second paper-feeding means for feeding sheets of papers to said image-forming means, over a second paper-feeding distance different from said first paper-feeding distance;

selection means for selecting either said first paper-feeding means or said second paper-feeding means while said image-forming means is continuously forming an image;

memory means for determining the start timings of said first and second paper-feeding means in accordance with the first and second paper-feeding distances, before said selection means selects either said first paper-feeding means or said second paper-feeding means; and

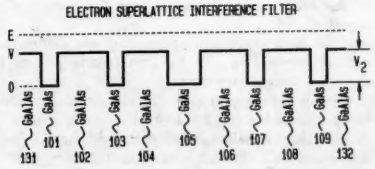
driver means for driving either said first paper-feeding means or said second paper-feeding means in accordance with the start timings determined by said memory means.

4,985,737

SOLID STATE QUANTUM MECHANICAL ELECTRON AND HOLE WAVE DEVICES

Thomas K. Gaylord; Kevin F. Brennan, and Elias N. Glytsis, all of Atlanta, Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Nov. 16, 1988, Ser. No. 272,175
Int. Cl.[5] H01L *27/12*
U.S. Cl. 357—4 **16 Claims**



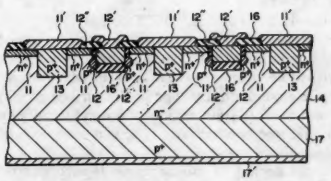
1. A solid state quantum mechanical electron wave device comprising a superlattice structure which is comprised of a multiplicity of adjacent layers of semiconductor material, each of which layers has a potential energy barrier and supports substantially ballistic electron transport at energies above the potential energy barrier of the layer.

4,985,738

SEMICONDUCTOR SWITCHING DEVICE

Jun-ichi Nishizawa, and Tadahiro Ohmi, both of Sendai, Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation of Ser. No. 412,194, Aug. 27, 1982, which is a continuation of Ser. No. 996, Mar. 16, 1979, abandoned. This application Dec. 5, 1986, Ser. No. 939,259
Claims priority, application Japan, Jan. 6, 1978, 53-740; Jan. 9, 1978, 53-1408
Int. Cl.[5] H01L *29/80, 29/74, 27/02, 27/10*
U.S. Cl. 357—22 **4 Claims**



1. In a semiconductor static induction thyristor of the type

including at least one first highly-doped semiconductor anode region of a second conductivity type, a plurality of second highly doped cathode regions, and a plurality of high resistive channel semiconductor regions wherein said cathode and channel regions have a first conductivity type opposite of said second conductivity type; said first, second and high resistive channel regions being relatively disposed in a semiconductor body to define respective current paths between said first anode and second cathode regions through said channel regions and further including highly doped gate regions of a second conductivity type having a width narrower than said channel regions, the improvement wherein, with respect to each of said respective plural channel regions, said gate regions comprise:

a driving gate semiconductor region of a second conductivity type opposite of said first conductivity type and being disposed on a side wall of a recess formed in said semiconductor body, said driving gate region being forward-biased and reverse-biased when said thyristor is turned on and turned off, respectively;

an associated non-driving gate semiconductor region of said second conductivity type disposed adjacent to a portion of said channel region and in direct contact with said cathode regions connected to said channel region to face said anode region and being separated from said driving gate semiconductor region;

means for electrically interconnecting said driving gate region with the driving gate regions associated with each of the other channel regions and for applying control signals thereto;

means for electrically interconnecting said associated non-driving gate region with the non-driving gate regions of the other channel regions;

said driving gate region and said non-driving gate regions being disposed in relation to each other to jointly control current flow in said current path by charge injection in and about said channel region, said driving gate region generating a depletion layer extending into said channel region in response to said control signals, said non-driving gate region generating a depletion layer extending into said channel region independently of said control signals;

said anode region having an impurity concentration of a level providing charge carrier injection for transfer with said subsidiary gate regions, said subsidiary gate regions being disposed in relation therewith whereby to absorb a substantial portion of charge carriers injected therefrom during high-power operation of said thyristor; and

said highly doped gate region being responsive to control signals applied thereto for controllably generating depletion layers extending into said channel regions to control current flow through said current paths.

4,985,739

LOW-LEAKAGE JFET

Jerome F. Lapham, Groton, and Adrian P. Brokaw, Burlington, both of Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Division of Ser. No. 658,270, Oct. 5, 1984, abandoned. This application Apr. 27, 1987, Ser. No. 42,711

Int. Cl.[5] H01L *29/80, 23/48*

U.S. Cl. 357—22 **13 Claims**

1. A low-leakage-current JFET comprising:

a semi-conductor body comprising a lightly doped layer of one conductivity type having a generally planar surface;

a first source/drain region of a conductivity type opposite said one conductivity type in the surface of said body;

a second source/drain region of a conductivity type opposite said one conductivity type and surrounding said first source/drain region;

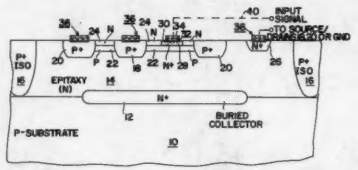
a channel region of conductivity type opposite said one conductivity type extending between said first and second source/drain regions at a shallow depth just below said surface;

a shield layer of said one conductivity type above said channel region and serving as the top gate for said JFET;

said lightly doped layer serving as the bottom gate of said JFET;

said bottom gate layer being conductively isolated from said top gate;

top gate contact means for said shield layer having an upper portion connectible to terminal means to convey electrical signals to said top gate;



said top gate contact means comprising a nonpentrating contact layer over at least a portion of said top gate;

said top gate contact means further comprising an interior contact segment in said top gate portion comprising additional impurity of said one conductivity type located wholly above the level of said channel region;

said top gate contact means serving to avoid conductive electrical connection from said upper portion thereof through said channel region to said lightly-doped layer.

4,985,740

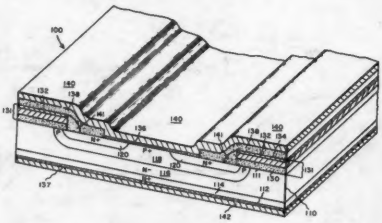
POWER FIELD EFFECT DEVICES HAVING LOW GATE SHEET RESISTANCE AND LOW OHMIC CONTACT RESISTANCE

Krishna Shenai, Schenectady, N.Y.; Bantval J. Baliga, Raleigh, N.C.; Patricia A. Piacente, and Charles S. Korman, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 1, 1989, Ser. No. 359,811

Int. Cl.[5] H01L *29/100, 27/020, 29/780, 29/040*

U.S. Cl. 357—23.4 **5 Claims**



1. A multi-cellular, field effect, power semiconductor device comprising:

a body of semiconductor material having opposed first and second major surfaces and a first region of one type conductivity extending to said first major surface, said first major surface being planar;

an insulated gate electrode layer disposed on said first major surface, said insulated gate electrode having a plurality of apertures therein;

said gate electrode layer including:

an oxide layer formed on said first major surface of said wafer,

a polysilicon layer formed on said oxide layer,

a tungsten silicide layer formed on said polysilicon layer, and

said gate electrode's oxide layer, polysilicon layer and tungsten silicide layer having vertically aligned edge profiles;

a plurality of cells, each associated with one of said apertures in said gate electrode layer, each of said cells comprising:

a second region of opposite type conductivity extending into said first region from said first major surface beneath the gate electrode aperture for that cell,

a third region of said one type conductivity disposed in said second region and extending to said first major surface,

said second and third regions being self-aligned with respect to the gate electrode aperture for that cell,

said second region including a channel portion disposed between said first and third regions, beneath said insulated gate electrode and self-aligned with respect to the gate electrode aperture for that cell, and

said second and third regions having a layer of tungsten disposed thereon in ohmic contact therewith, said tungsten layer being self-aligned with respect to said aperture in said gate electrode and spaced from said gate electrode;

a layer of dielectric disposed over said body of semiconductor material and having a plurality of contact apertures therein, each of said contact apertures being situated over said tungsten layer of a different cell, said dielectric layer being disposed between said tungsten layer and said insulated gate electrode layer; and

a layer of metallization disposed over said dielectric layer, extending into said contact aperture and into ohmic contact with each of said tungsten layers.

4,985,741

MOS-CONTROLLED BIPOLAR POWER SEMICONDUCTOR COMPONENT

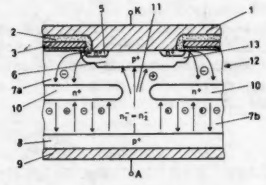
Friedhelm Bauer, and Thomas Stockmeier, both of Würenlingen, Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Jun. 14, 1990, Ser. No. 546,911

Claims priority, application Switzerland, Jun. 30, 1989, 2440/89

Int. Cl.[5] H01L *29/72*

U.S. Cl. 357—34 **9 Claims**



1. An MOS-controlled bipolar power semiconductor component comprising

(a) a semiconductor substrate (12) with an anode (A) and a cathode (K);

(b) an emitter layer (8) on the anode side in the semiconductor substrate (12), in the center a base layer (7) doped oppositely to the emitter layer (8), and on the cathode side a plurality of collector regions (6) which protrude from the surface of the semiconductor substrate (12) into the base layer (7) and are doped with the same polarity as the emitter layer (8); and

(c) around the collector regions (6), vertical MOS transistors which comprise in each case a source region (5) doped oppositely to the emitter layer (8), a channel region (13) doped with the same polarity as the collector region (6), the base layer (7) and an insulated gate electrode (3) arranged above the channel region (13); wherein

(d) a recombination layer (10) which is doped highly and with the same polarity as the base layer (7) is arranged within the base layer (7) between the collector regions (6) and the emitter layer (8), which recombination layer (10) subdivides the base layer (7) into an upper base layer (7*a*) and a lower base layer (7*b*); and

(e) the recombination layer (10) exhibits a plurality of openings (11) by means of which the upper base layer (7*a*) is connected to the lower base layer (7*b*).

4,985,742

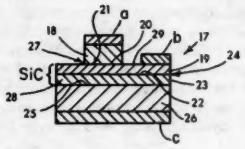
HIGH TEMPERATURE SEMICONDUCTOR DEVICES HAVING AT LEAST ONE GALLIUM NITRIDE LAYER

Jacques I. Pankove, Boulder, Colo., assignor to University of Colorado Foundation, Inc., Boulder, Colo.

Filed Jul. 7, 1989, Ser. No. 376,786

Int. Cl.[5] H01L *29/161, 29/72, 27/14*

U.S. Cl. 357—34 **19 Claims**



9. An amplifying photoreceptor comprising:

a semiconductor device having an emitter, a base and a collector, said base having at least one surface adapted to receive radiation and being formed from a layer of cubic p-type silicon carbide;

said emitter being formed from a layer of cubic n-type gallium nitride provided on said surface.

4,985,743

INSULATED GATE BIPOLAR TRANSISTOR

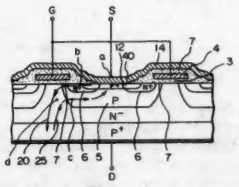
Norihito Tokura, Okazaki; Hiroyasu Ito, and Naoto Okabe, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 19, 1988, Ser. No. 221,354

Claims priority, application Japan, Jul. 21, 1987, 62-181809; Apr. 15, 1988, 63-93692

Int. Cl.[5] H01L *29/747, 29/10, 29/78, 29/72*

U.S. Cl. 357—39 **18 Claims**



1. An insulated gate bipolar transistor, which comprises:

a first conductivity type semiconductor substrate;

a second conductivity type semiconductor layer, formed on and above said substrate;

a base layer of said first conductivity type formed on at least a surface of said semiconductor layer;

a source layer formed on at least a surface of said base layer, whereby a PN junction is formed between said source layer and said base layer, and said source layer is arranged therein in such a manner to form a channel region in said base layer and between said source layer and said semiconductor layer;

a gate electrode formed above said channel region;

a gate insulating film interposed between said channel region and said gate electrode;

a source electrode, electrically coupled to said base layer and to said source layer;

wherein, when said channel region is made conductive by applying an electrical voltage to said gate electrode, a first passage is formed in which a first carrier flows from said source electrode to said semiconductor substrate through said source layer, said channel region and said semiconductor layer, and simultaneously, a second passage is formed in which a second carrier flows from said semiconductor substrate to said source electrode through said semiconductor layer and said base layer; and

a voltage dropping portion in a predetermined passage for said first carrier between said source electrode and said source layer;

wherein said electrode has a portion thereof provided over a predetermined surface portion of said source layer and said voltage dropping portion includes a resistance film provided between said predetermined portion of said source layer and said source electrode, provided directly above the predetermined portion of said source layer in a way to provide a substantially vertical voltage drop to said semiconductor layer and to prevent a combination of said semiconductor substrate, said semiconductor layer, said base layer, and said source layer from acting as a thyristor.

4,985,744

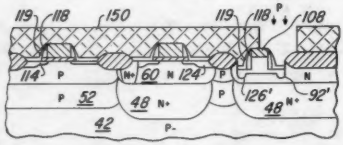
METHOD FOR FORMING A RECESSED CONTACT BIPOLAR TRANSISTOR AND FIELD EFFECT TRANSISTOR

David B. Spratt, Plano; Robert L. Virkus, Dallas; Robert H. Eklund, and Eldon J. Zorinsky, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 191,672, May 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 149,785, Jan. 29, 1988, abandoned. This application Sep. 21, 1989, Ser. No. 411,208

Int. Cl.[5] H01L *27/02, 27/01, 29/72, 29/06*

U.S. Cl. 357—43 **5 Claims**



1. An integrated circuit having a bipolar transistor and a field effect transistor, comprising:

a collector region of a first conductivity type formed in a first portion of a semiconductor substrate;

a base region of a second conductivity type formed in an upper portion of said collector region;

an emitter region of said first conductivity type formed in a semiconductor layer overlying said base region;

a gate electrode formed in said semiconductor layer overlying a second portion of said semiconductor substrate and defining the source to drain path of said field effect transistor;

a first recess extending through at least a portion of said base region and having at least one wall adjacent to one side of said emitter region;

a second recess extending through at least a portion of said base region and having another wall adjacent to another side of said emitter region;

a base contact region doped to said second conductivity type, formed in said first recess in said base region and spaced from said at least one wall;

a collector contact region doped to said first conductivity type formed in said second recess in said base region and spaced from said another wall; and

said collector contact region being spaced from said another wall by a distance greater than that of the distance said base contact region is spaced from said at least one wall.

4,985,745

SUBSTRATE STRUCTURE FOR COMPOSITE SEMICONDUCTOR DEVICE

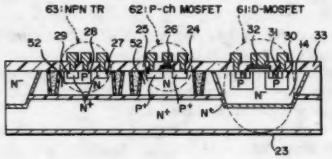
Koichi Kitahara, Kawasaki; Yoshinori Natsume, Hyogo, and Yoshinori Hosoki, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 3, 1989, Ser. No. 293,026

Claims priority, application Japan, Jan. 5, 1988, 63-465

Int. Cl.[5] H01L *21/20, 21/76, 21/38*

U.S. Cl. 357—49 **8 Claims**



1. A semiconductor substrate for a composite semiconductor device comprising:

a composite substrate formed by bonding the main surface of a first semiconductor substrate and the main surface of a second semiconductor substrate together with an insulation film interposed therebetween;

an etched portion formed by selectively etching said insulation film and said first semiconductor substrate of said composite substrate to reach at least said second semiconductor substrate;

an epitaxial layer formed on said second semiconductor substrate to fill said etched portion, said epitaxial layer being electrically connected to said first and second semiconductor substrates; and

an impurity layer formed between said first semiconductor substrate and epitaxial layer extending to the surface of said composite substrate, said impurity layer having an etching rate different from etching rates of said first semiconductor substrate and epitaxial layer.

4,985,746

SEMICONDUCTOR DEVICE AND METHOD OF PRODUCTION

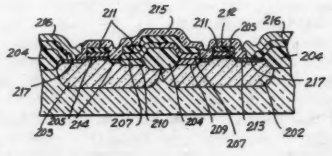
Michio Asahina, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 807,408, Dec. 10, 1985, abandoned. This application Jul. 16, 1987, Ser. No. 75,245

Claims priority, application Japan, Dec. 11, 1984, 59-261251

Int. Cl.[5] H01L *23/48*

U.S. Cl. 357—67 **12 Claims**



1. A semiconductor device comprising:

a substrate of a first conductivity type;

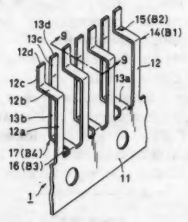
a well region of a second conductivity type formed in said substrate;
a first gate insulating film provided on a portion of said well region;
a first polycrystalline silicon gate of the first conductivity type formed on the first gate insulating film;
a second gate insulating film provided on a portion of said substrate;
a second polycrystalline silicon gate of the second conductivity type formed on the second gate insulating film;
first source and drain regions provided in the well region on either side of the first polycrystalline silicon gate;
first polycrystalline silicon wiring of the first conductivity type drawn from the first drain region;
second source and drain regions provided in the substrate on either side of the second polycrystalline silicon gate;
second polycrystalline silicon wiring of the second conductivity type drawn from the second drain region, said wiring of said first conductive type drawn from the first drain region being directly connected to the wiring of the second conductive type; and
a metal silicide film formed on substantially the entire surfaces of the polycrystalline silicon wiring and the polycrystalline silicon gates without contacting the source or drain regions.

4,985,747

TERMINAL STRUCTURE AND PROCESS OF FABRICATING THE SAME

Jiro Utunomiya; Saburo Iida; Hitosi Sibuya; Kazunori Kusaba, and Isao Narumi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1989, Ser. No. 361,658
Claims priority, application Japan, Jun. 9, 1988, 63-140552; Jun. 9, 1988, 63-140553
Int. Cl.[5] H01L *23/50, 25/10*
U.S. Cl. 357—68 **6 Claims**



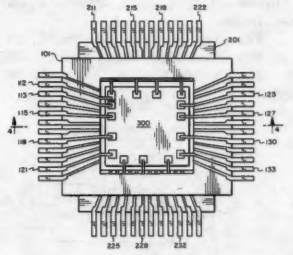
1. A multiple-terminal unit comprising:
a strip-shaped connecting part formed in a first plane;
a first group of teeth in a first teeth row, said first teeth row extending in a given direction, each of the teeth of said first group extending from one edge of the connecting part;
a second group of teeth in a second teeth row, said second teeth row extending in said given direction, each of the teeth of said second group extending from said one edge of the connecting part;
the teeth of said first group being provided at alternate positions and the teeth of said second group being provided at intervening positions between the alternate positions;
each tooth in said first group having a first stem part having one end continuous with the connecting part and extending in said first plane, a first lateral part having one end continuous with the other end of the first stem part, and extending at an angle with the first stem part, and a first end part having one end continuous with the first lateral part and extending in parallel with the first stem part;
each tooth in said second group having a second lateral part having one end continuous with the connecting part and extending at an angle with the connecting part, a second stem part having one end continuous with the other end of the second lateral part and extending in a second plane in parallel with the first plane, and an end part having one end continuous with the second stem part and extending in said second plane;
the first and second end parts of said teeth in said first group and said second group being aligned with each other;
said first stem parts being aligned with each other;
said second stem parts being aligned with each other;
said first stem parts being spaced relative to said second stem parts in both a direction transverse to said first plane and said given direction, said connecting part and said teeth in said first and said second groups are all formed from an integral metal sheet.

4,985,748

UNIVERSAL TAPE FOR USE IN TAPE AUTOMATED BONDING SYSTEM

Thomas D. Belanger, Jr., Saline, Mich., assignor to AG Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 27, 1989, Ser. No. 457,637
Int. Cl.[5] H01L *23/48, 23/28, 39/02*
U.S. Cl. 357—69 **5 Claims**



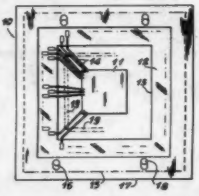
1. A universal tape arrangement to accommodate an integrated circuit chip as part of an improved method of tape automated bonding comprising:
a first tape including a series of parallel continuous thin metal beam lead conductors superimposed on a flexible substrate, each conductor spaced from the other;
a second tape comprising a series of parallel continuous thin metal beam lead conductors superimposed on a flexible substrate, each conductor spaced from the other;
said first and said second tape disposed at right angles to each other to form a square matrix of beam lead conductors;
said tape arrangement trimmed to match said bonding pad locations of said integrated circuit chip whereby one of said tapes serves as a carrier and the other tape has the substrate removed in an area of the integrated circuit, in order that a portion of said beam lead conductors provide support and connection to said chip.

4,985,749

SUBSTRATE FOR VERY LARGE SCALE INTEGRATED CIRCUIT AND APPARATUS FOR SELECTIVE TINNING OF THE SUBSTRATE LEADS

Claude Berneur, Beaucouze, and Jean-Pierre Boiteau, Villeveque, both of France, assignors to Bull S.A., Paris, France

Filed Mar. 20, 1989, Ser. No. 325,939
Claims priority, application France, Mar. 22, 1988, 88 03674
Int. Cl.[5] H01L 23/48
U.S. Cl. 357—70 11 Claims



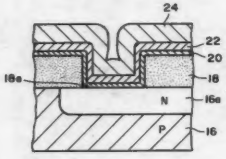
1. A substrate for an integrated circuit, comprising an insulating sheet, a window in the insulating sheet, and cantilevered leads around the window, each of said leads having a tinned zone extending along only a portion of the length of said leads on the inside of the window and spaced apart from an end zone for connection to the integrated circuit inside the window.

4,985,750

SEMICONDUCTOR DEVICE USING COPPER METALLIZATION

Kazuhiro Hoshino, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 17, 1987, Ser. No. 97,738
Claims priority, application Japan, Sep. 17, 1986, 61-218302
Int. Cl.[5] H01L 23/48, 29/46, 29/54
U.S. Cl. 357—71 13 Claims



1. A semiconductor device comprising:

a silicon substrate having a main surface;

an insulating film deposited on the main surface of said silicon substrate and having at least one contact hole extending therethrough exposing the underlying main surface of the silicon substrate;

a non-copper containing metallic layer deposited on the main surface of said silicon substrate exposed through said contact hole, and forming an ohmic contact to said silicon substrate;

a non-copper containing barrier layer deposited on said metallic layer, the barrier layer comprising a material which prevents reaction and interdiffusion between copper and silicon; and

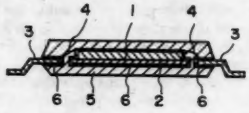
a metallization film comprising copper as a major component deposited on said barrier layer.

4,985,751

RESIN-ENCAPSULATED SEMICONDUCTOR DEVICES

Toshio Shiobara, Annaka; Takashi Tsuchiya, Takasaki, and Hisashi Shimizu, Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,600
Claims priority, application Japan, Sep. 13, 1988, 63-229368
Int. Cl.[5] H01L 23/28
U.S. Cl. 357—72 12 Claims



1. A resin-encapsulated semiconductor device comprising a die pad, a silicon chip on the die pad, a lead frame electrically connected to the silicon chip, and an encapsulating resin molded over the elements, wherein

at least the rear surface of the die pad remote from the silicon chip is treated with a primer comprising a silane coupling agent having the general formula

$$X-(CH_2)_n-Si(OR)_mR'_{3-m}$$

wherein X is an organic radical having up to 15 carbon atoms and having at least one member selected from the group consisting of epoxy, amino, carboxyl, hydroxyl, ureido, malemide, and trialkoxysilyl radicals,

R is a monovalent hydrocarbon radical having 1 to 6 carbon atoms,

R' is a monovalent hydrocarbon radical having 1 to 6 carbon atoms,

n is an integer of from 1 to 10, and

m is an integer of from 1 to 3, or a partial hydrolyzate thereof, and a bond-improving agent selected from the group consisting of organotitanates, primary, secondary and tertiary amines and cycloamidine derivatives in an amount of 0.001 to 100 parts by weight to 100 parts by weight of the silane coupling agent, and

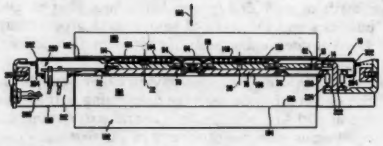
the encapsulating resin comprises an epoxy resin encapsulant having a tensile elongation of at least 0.7% at room temperature (25° C.) and a moisture pickup of up to 0.6% by weight after it is allowed to stand for 72 hours in an atmosphere at 85° C. and a relative humidity of 85%.

4,985,752

HERMETICALLY SEALED COMPRESSION BONDED CIRCUIT ASSEMBLY HAVING A SUSPENSION FOR COMPRESSION BONDED SEMICONDUCTOR ELEMENTS

Lawrence E. Crowe, Lindenwood, and Thomas A. Sutrina, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 1, 1988, Ser. No. 226,740
Int. Cl.[5] H01L 23/42, 23/44, 23/46
U.S. Cl. 357—79 42 Claims



1. A hermetically sealed circuit assembly containing a plurality of circuit elements which are to be compression bonded

upon application of a force through opposed first and second walls of a hermetically sealed chamber containing the circuit elements to be compression bonded comprising:

a plurality of columns within the chamber with circuit element to be compression bonded being disposed in a separate column;

an inelastically deformed spring, positioned in each of the columns outside the chamber having a first surface facing an outside surface of one of the first and second walls of the hermetically sealed chamber and a second surface with each of the second surfaces of the deformed springs facing an outside surface of another of the first and second walls and deformed to compensate for variation in thickness of parts within the columns; and

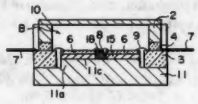
a thickness of the columns measured between the outside surfaces of the first and second walls prior to compression bonding being substantially identical.

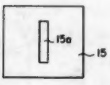
4,985,753

SEMICONDUCTOR PACKAGE

Takashi Fujioka, and Masahide Yamanouchi, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 1, 1989, Ser. No. 388,075
Claims priority, application Japan, Mar. 17, 1989, 1-65663
Int. Cl.[5] H01L *23/14, 23/12*
U.S. Cl. 357—80 **22 Claims**





1. A semiconductor package comprising a package body including a cavity, a metal package base including a substantially planar surface disposed within the cavity, at least one semiconductor chip mounted on the surface, a substrate cracking prevention plate mounted on the surface within the cavity, and a dielectric substrate disposed on the substrate cracking prevention plate wherein the substrate cracking prevention plate has a coefficient of thermal expansion intermediate the coefficients of thermal expansion of the metal package base and the dielectric substrate and includes at least one central opening, the at least one semiconductor chip being disposed within the opening surrounded by the substrate cracking prevention plate.

4,985,754

HIGH INDEX COLOR ENCODING SYSTEM

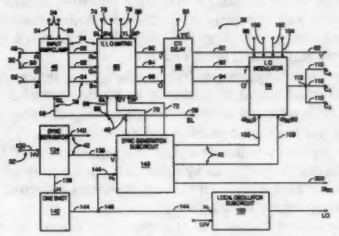
William C. Levan, 1567 Clarita Ave., San Jose, Calif. 95130

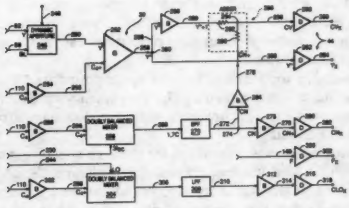
Filed Feb. 10, 1989, Ser. No. 309,284
Int. Cl.[5] H04N *9/65*
U.S. Cl. 358—23 **20 Claims**

18. In a color encoding system for encoding RGB color video inputs for output as video signals in other signal formats, the improvement comprising:

matrixing the separate R,G, and B input signals to provide a luminance component and two or more distinct chrominance components; modulating said chrominance components at a modulation carrier frequency substantially higher than a desired output carrier frequency;

reconstituting said chrominance components as a combined chrominance signal carried on said desired output carrier frequency; and





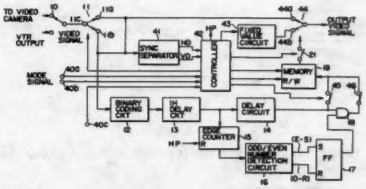
additionally reconstituting said chrominance components as a combined chrominance signal carried on a supplemental carrier frequency.

4,985,755

AREA SPECIFYING SIGNAL GENERATION DEVICE USING OUTPUT VIDEO SIGNAL FROM VIDEO CAMERA

Kenji Shimoda, and Shin-ichi Oosawa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 26, 1989, Ser. No. 456,736
Claims priority, application Japan, Dec. 27, 1988, 63-329757
Int. Cl.[5] H04N *9/74, 5/262*
U.S. Cl. 358—22 **5 Claims**



1. An area specifying signal generation device using an output video signal from a video camera, comprising:

binary-coding means for converting into a binary-coded signal an image signal which is derived by photographing a subject having a solid-color surface on which an area edged or surrounded by a boarder line is specified, and which includes an edge signal corresponding to the surrounded area;

1 H delay means for delaying an output video signal of said binary-coding means by one horizontal scanning period;

edge counting means, connected to receive an output video signal from said 1 H delay means and which is reset at each horizontal period, for counting the edge signal by

effecting a counting-up operation each time the edge signal corresponding to the surrounded area is supplied;

odd/even number detection means, for determining whether a counting output of said edge counting means is odd or even, and to supply an odd/even number detection signal indicating whether the counting output of said edge counting means is odd or even;

gate switching means for supplying an inverted or non-inverted signal in response to an odd number detection signal or even number detection signal from said odd-/even number detection means;

a delay circuit, for delaying the output of said 1 H delay means, in order to synchronize the output of said 1 H delay means with the inverted or non-inverted output of said gate switching means;

logic means connected to receive the output of said delay circuit and the inverted or non-inverted output of said gate switching means. for supplying an output signal corresponding to the logical product of the outputs of said delay circuit and said gate switching means in order to create area specifying data, specifying an area from the odd numbered counting output to the even numbered counting output;

a memory for storing the area specifying data;

readout means for reading the area specifying data from said memory, in synchronism with a video signal to be processed; and

switching means controlled by the area specifying data read out by said readout means, for replacing the to-be-processed video signal by another signal and generating the same when the area specifying data is set at a preset level.

4,985,756

SPECIAL EFFECT SYSTEM FOR VIDEO SIGNAL

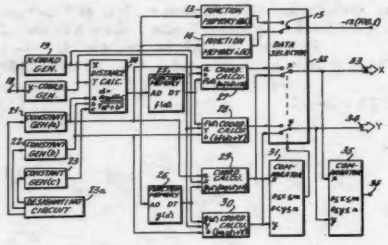
Shigehisa Kawabe, and Keiichi Hirayama, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Nov. 3, 1988, Ser. No. 266,698

Claims priority, application Japan, Nov. 6, 1987, 62-280648

Int. Cl.[5] H04N 9/535

U.S. Cl. 358—22 **4 Claims**



1. A special effect system for processing a video signal, the system including:

a video memory;

write address generating means for generating a write address for storing an image in the video memory;

reading address generating means for generating a read address, wherein a special effect picture is created by controlling the read address generated by said reading address generating means, said reading address generating means comprising:

means for setting constants a, b, c, said constants associated with a straight line which acts as a reference line for a special effect imparted to a video image, said straight line defined by $(ax+by+c=0)$;

a coordinate generator, responsive to a clock signal which is synchronized with a television sequence, for generating an x-coordinate and a y-coordinate, said x-coordinate and said y-coordinate defining coordinates (X, Y) of an arbitrary picture element;

a distance calculating means for calculating a distance d of the coordinates (X, Y) to said straight line specified by said constants a, b and c;

a first function generator for generating first and second function data f(d) and g(d) according to first predefined input/output relationships and based on said distance d;

a read address producing means for producing the read address for the video memory based on the first and second function data f(d) and g(d), the coordinates (X, Y) and the constants a and b;

a second function generator for generating third and fourth function data h(d) and i(d) according to second predefined input/output relationships and based on said distance d; and

brightness modifying means coupled to said video memory for modifying the magnitude of a luminance component contained in a video signal read-out from said video memory in response to the third and fourth data h(d) and i(d).

4,985,757

DIGITAL VIDEO SIGNAL PROCESSING SYSTEM

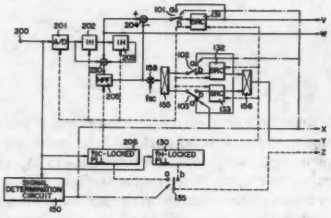
Seijiro Yasuki, Yokohama, and Masahiro Yamada, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1988, Ser. No. 249,697

Claims priority, application Japan, Sep. 30, 1987, 62-244013

Int. Cl.[5] H04N 9/46

U.S. Cl. 358—31 **14 Claims**



9. A method of processing a digital video signal for use in a television receiver which includes luminance/chrominance signal separating means for separating a received composite color digital video signal into a luminance signal and a chrominance signal on the basis of an inter-line operation; and sequential scan converting means for converting, by double-speed changing, each of the luminance signal and the chrominance signal output from said luminance/chrominance separating means into a sequential scan signal, said method comprising the steps of:

causing said luminance/chrominance separating means and said sequential scan converting means to operate in accordance with clocks phase-locked to a color subcarrier when synchronizing signals of the received composite color television signal are standard signals; and

causing said luminance/chrominance separating means to operate in accordance with clocks phase-locked to the color subcarrier and causing said sequential scan converting means to operate in accordance with clocks phase-locked to horizontal synchronizing signals when the synchronizing signals of the received composite color television signal are non-standard signals.

4,985,758

SIGNAL PROCESSING SYSTEM HAVING SELECTED OUTPUT FROM PLURAL READOUT DEVICES

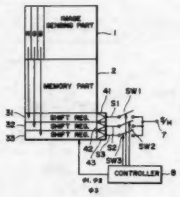
Seiji Hashimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 557,940, Dec. 5, 1983, abandoned. This application May 14, 1990, Ser. No. 522,457

Claims priority, application Japan, Dec. 7, 1982, 57-214413; Dec. 10, 1982, 57-216388

Int. Cl.[5] H04N *9/077, 3/15, 5/335*

U.S. Cl. 358—44 56 Claims



1. A signal processing chip comprising:

(a) a chip;

(b) a storage unit on said chip for storing a plurality of signals of different colors;

(c) a plurality of readout units on said chip for dividing the color signals from each line of said storage unit, and for reading out the divided color signals; said plurality of readout units comprising a charge transfer structure;

(d) switching means on said chip for selectively supplying to a common output terminal the color signals read out by said plurality of readout units as a color sequential signal;

(e) an output amplifier arranged at an end of each one of said plurality of readout units; and

(f) a dummy amplifier which has the same electrical characteristics as said output amplifiers and which is arranged so that the color signals read out by said plurality of readout units are not inputted to it.

4,985,759

METHOD AND APPARATUS FOR EXTRACTING BLACK COLOR COMPONENT

Takanori Ito, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 4, 1989, Ser. No. 333,026

Claims priority, application Japan, Apr. 5, 1988, 63-83733; Apr. 21, 1988, 63-99171

Int. Cl.[5] H04N *1/46*

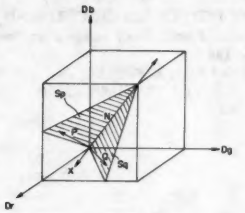
U.S. Cl. 358—79 29 Claims

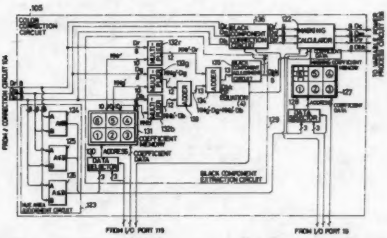
1. A method of extracting a black color component from input image signals of basic colors, representative of color separated input images, said method comprising the steps of:

judging to which hue area among at least three predetermined hue areas the hue represented by said input image signals belongs;

setting black color extraction parameters with respect to the judged hue area, the black color extraction parameters being determined from two chromatic colors P and Q positioned in respective boundary planes which define said judged hue area and from an achromatic color N; and

extracting the black color component contained in said input images in accordance with said set black color extraction





parameters to produce a black color component signal representative of the extracted black color component.

4,985,760

COLOR IMAGER HAVING VARYING FILTER APERTURE SIZES TO COMPENSATE FOR LUMINANCE DIFFERENCES BETWEEN COLORS

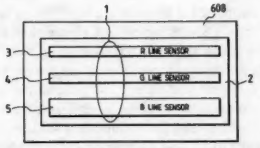
Katsuyoshi Maeshima; Atsushi Takeda, both of Yokohama; Shinobu Arimoto, and Shizuo Hasegawa, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,671

Claims priority, application Japan, Oct. 9, 1987, 62-255069; Oct. 23, 1987, 62-268847; Nov. 17, 1987, 62-291593

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—80 7 Claims



1. A color image reading apparatus comprising:

a plurality of line sensors which have different color filters and each of which has a plurality of light receiving elements, one of said plurality of line sensors having an opening width larger than those of remaining ones of said plurality of line sensors;

correcting means for correcting image signals output from said plurality of line sensors so as to obtain identical resolutions of the image signals; and

processing means for performing color processing of the image signals corrected by said correcting means,

wherein said correcting means performs edge emphasis of

the image signals output from the line sensor having the larger opening width.

4,985,761

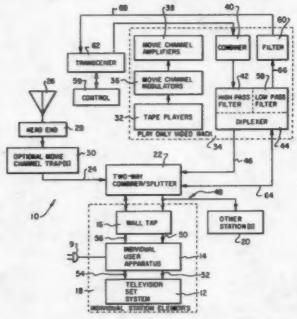
CURRENT DETECTION CIRCUIT AND METHOD

David G. Adams, Plano, Tex., assignor to Spectradyne, Inc., Richardson, Tex.

Filed Mar. 2, 1989, Ser. No. 318,166

Int. Cl.[5] H04N *17/04*

U.S. Cl. 358—84 **15 Claims**



1. An apparatus for sensing operational status of a television system, including a television set, said apparatus comprising:

a reference voltage source,

a current sensing element,

means for determining a level of operation of said system comprising first voltage generating means for generating a voltage output directly related to current sensed by said sensing element, second voltage generating means for generating a maximum positive excursion voltage directly related to current sensed by said sensing element, third voltage generating means for generating an other voltage directly related to the minimum level of voltage directly related to current sensed by said sensing element,

means for producing a differential output voltage proportional to the difference between said maximum positive excursion voltage and said other voltage, and

means for comparing said level of operation to said reference voltage source,

wherein said current sensing element comprises a current sense transformer, wherein said first voltage generating means comprises a summing amplifier, wherein said second voltage generating means element comprises a positive peak detection circuit, wherein said third voltage generating means comprises a negative peak detection circuit, wherein said means for producing said differential output voltage comprises a differential amplifier, and wherein said means for comparing said level of operation of said system to said reference voltage source comprises a comparator.

4,985,762

PANORAMIC INTERACTIVE SYSTEM

Graham T. Smith, Toronto, Canada, assignor to Horisonscan Inc., Toronto, Canada

Filed Dec. 11, 1989, Ser. No. 448,263

Claims priority, application United Kingdom, Dec. 14, 1988, 8829135

Int. Cl.[5] H04N *5/76*

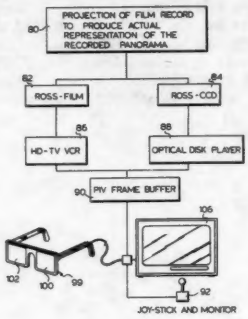
U.S. Cl. 358—87 **17 Claims**

1. A method for accurately recording an image of at least 180°, comprising:

at least a two stage method,

said first stage comprising:

recording a panorama of at least 180° in a manner not suitable for video, said second stage comprising:



projecting the recorded image in a manner suitable for display on a cylindrical screen and recording the projected image in a manner suitable for reproducing selected portions of the recorded projected image on a video display device.

4,985,763

JET NOZZLE FOR PROPELLING AN APPARATUS ALONG A CONDUIT AND APPARATUS PROVIDED WITH SUCH A JET NOZZLE

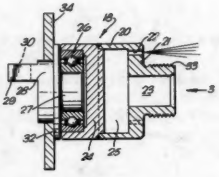
Andrew A. Fraser, 5 Michelmersh Green, Bournemouth, Dorset, England BH8 ONU

Continuation of Ser. No. 277,770, Nov. 30, 1988, abandoned. This application Sep. 18, 1989, Ser. No. 409,968

Claims priority, application United Kingdom, Dec. 1, 1987, 8728089

Int. Cl.[5] H04J *7/18*; B08B *3/00*

U.S. Cl. 358—100 **13 Claims**



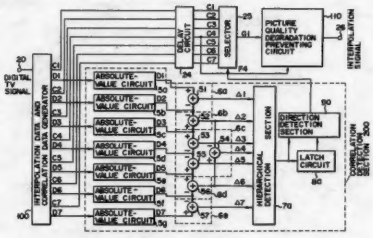
1. A jet nozzle for use in propelling apparatus along a conduit, comprising a casing having at one end an end wall, a transverse wall spaced from said end wall and defining with said casing and said end wall a chamber, a plurality of openings in said end wall communicating with said chamber, an inlet in communication with said chamber, means for connecting a hose to said inlet, a bearing provided on said casing at the side of said transverse wall remote from said chamber, and a connector member for connecting the jet nozzle to said apparatus mounted by said bearing for rotation relative to said casing and extending from the other end of said casing.

4,985,764

APPARATUS FOR DETECTING A PIXEL CORRELATION AND GENERATING AN INTERPOLATION SIGNAL FOR A DIGITAL TELEVISION SIGNAL

Koichi Sato, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 8, 1989, Ser. No. 391,294
Claims priority, application Japan, Sep. 29, 1988, 63-244841
Int. Cl.[5] H04N 5/14
U.S. Cl. 358—105 6 Claims



1. An apparatus for detecting a pixel correlation for a digital television signal comprising:

correlation data generation means having four regions imaged, which regions are the upper right region, the upper left region, the lower right region, and the lower left region, and are divided by a vertical line and a horizontal line which cross at the position of a pixel to be interpolated, said correlation data generation means having means for generating a vertical direction correlation signal generated by deriving a difference between two pixels which are present on the vertical line and which respectively lie on upper and lower sides of the position of the pixel to be interpolated, a plurality of left-downward angle correlation signals created for respective pairs of pixels lying symmetrically in the upper right and lower left regions, respectively, and a plurality of right-downward angle correlation signals created for respective pairs of pixels lying symmetrically in the upper left and lower right regions, respectively, and

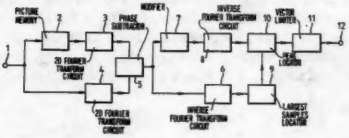
correlation detecting means including algorithm means for detecting the smallest one of the absolute values of the vertical correlation signal, a first left-downward angle correlation signal, and a first right-downward angle correlation signal, which signals are derived from said plurality of left-downward angle correlation signals and said plurality of right-downward angle correlation signals, by using pixels which are closest to the vertical line, detecting the smallest one of the absolute values of said vertical correlation signal and outputting data indicating the pixels which are used to obtain the smallest value as the correlation detection signal when the vertical correlation signal is detected to have the smallest value, detecting the smallest one of said plurality of left-downward angle correlation signals and outputting data indicating the direction and angle of pixels which are used to obtain the smallest value as the correlation detection signal when the first left-downward angle correlation signal is detected to have the smallest value, and detecting the smallest one of said plurality of right-downward angle correlation signals and outputting data indicating the direction and angle of pixels which are used to obtain the smallest value as the correlation detection signal when the first right-downward angle correlation signal is detected to have the smallest value.

4,985,765

METHOD AND APPARATUS FOR PICTURE MOTION MEASUREMENT WHEREBY TWO PICTURES ARE CORRELATED AS A FUNCTION OF SELECTIVE DISPLACEMENT

Gerard M. X. Fernando, Croydon, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 2, 1989, Ser. No. 388,422
Claims priority, application United Kingdom, Sep. 5, 1988, 8820838
Int. Cl.[5] H04N 7/01
U.S. Cl. 358—105 15 Claims



1. A method of picture motion measurement for the production of motion vectors, said method being characterized by the steps of:

(i) correlating two pictures to determine low resolution correlation as a function of displacement thereby to determine sample correlation values to a low resolution,

(ii) correlating said two pictures to determine higher resolution correlation as a function of displacement thereby to determine sample correlation values to a higher resolution,

(iii) determining the positions of a given number of sample points of greatest magnitude in said low resolution correlation function,

(iv) applying the positions found for said given number of sample points to said higher resolution correlation function to identify the corresponding sample points in said higher resolution correlation function,

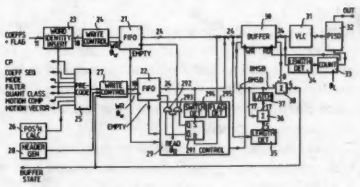
(v) determining the locations of peaks associated with the said number of sample points in said higher resolution correlation function which locations are defined to subsample interval accuracy.

4,985,766

VIDEO CODER

David G. Morrison; Andrew P. Heron, and David O. Beaumont, all of Ipswich, England, assignors to British Telecommunications public limited company, England

PCT No. PCT/GB88/00789, § 371 Date May 17, 1989, § 102(e) Date May 17, 1989, PCT Pub. No. WO89/03153, PCT Pub. Date Apr. 6, 1989
PCT Filed Sep. 23, 1988, Ser. No. 358,370
Claims priority, application United Kingdom, Sep. 23, 1987, 8722394
Int. Cl.[5] H04N 7/133, 7/137
U.S. Cl. 358—133 10 Claims



1. A video coder comprising:

first coding means for generating, for blocks of picture

elements of an image to be coded, image data indicative of the state of those elements;

second coding means for generating overhead data in respect of blocks and/or in respect of groups of blocks of picture elements, the overhead data including information as to the nature of coding employed by the first coding means;

a first buffer memory for storing the image data; a second buffer memory for storing the overhead data; means for inserting flags into the first and second buffer memories; and

means for selectively reading data from either the first buffer or the second buffer memory, the reading means being responsive to the occurence of a flag in the buffer memory being read to cease reading from that memory and to commence reading from the other memory, such that a desired sequence of image and overhead data is obtained.

4,985,767

SPATIO-TEMPORAL SUB-SAMPLING OF DIGITAL VIDEO SIGNALS REPRESENTING A SUCCESSION OF INTERLACED OR SEQUENTIAL IMAGES, TRANSMISSION OF HIGH-DEFINITION TELEVISION IMAGES, AND EMISSION AND RECEPTION STAGES FOR SUCH A SYSTEM

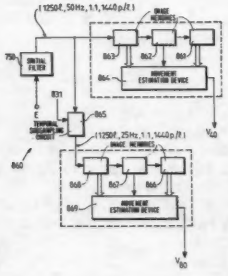
Mohammad R. Haghiri, Sceaux; Philippe Guntzburger, Epinay-sous-Senart, and Marcel Le Queau, Ozoir la Ferriere, all of France, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1989, Ser. No. 313,937

Claims priority, application France, Feb. 23, 1988, 88 02121; Apr. 15, 1988, 88 05010; Jun. 28, 1988, 88 08652; Jul. 8, 1988, 88 09294

Int. Cl.[5] H04N 7/12

U.S. Cl. 358—133 **9 Claims**



1. A device for spatio-temporally sub-sampling digital video signals representing a succession of images divided into blocks of m×n points (m and n being positive integers), said device comprising:

(a) means for spatially prefiltering said sequence of images to provide a sequence of band width limited images;

(b) means, coupled to said prefiltering means, for spatio-temporally sub-sampling said band width limited images;

(c) movement estimation means coupled to said sub-sampling means, comprising:

i. means for delivering signals corresponding to an odd image and even images surrounding said odd image in said sequence of images; and

ii. means, coupled to said delivering means, for estimating a motion vector which relates said odd image to said even images.

4,985,768

INTER-FRAME PREDICTIVE ENCODING SYSTEM WITH ENCODED AND TRANSMITTED PREDICTION ERROR

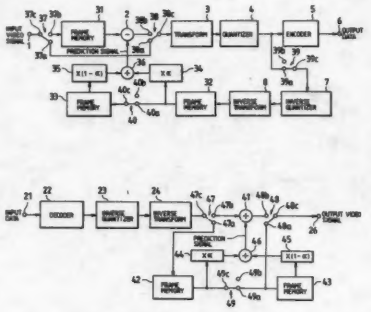
Kenji Sugiyama, Noda, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Jan. 18, 1990, Ser. No. 465,747

Claims priority, application Japan, Jan. 20, 1989, 1-11587; Feb. 14, 1989, 1-34161

Int. Cl.[5] H04N 7/12

U.S. Cl. 358—136 **5 Claims**



1. An inter-frame predictive encoding system comprising:

means for separating successively-inputted frames of a video signal into reference frames and dependent frames, the reference frames being spaced at predetermined intervals, the dependent frames situated between the reference frames;

means for encoding display information of the reference frames;

means for predicting display information of each dependent frame on the basis of display information of reference frames which precede and follow said dependent frame respectively;

means for generating an error between the predicted display information and corresponding actual display information of said dependent frame; and

means for encoding said error.

4,985,769

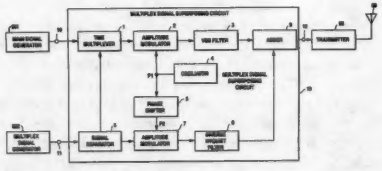
MULTIPLEX TV SIGNAL PROCESSING APPARATUS

Yoshio Yasumoto, Nara; Sadashi Kageyama, Hirakata; Shuji Inoue, Neyagawa; Yoshio Abe, Ibaraki, and Hideyo Uwabata, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 23, 1988, Ser. No. 174,452

Int. Cl.[5] H04N 7/04

U.S. Cl. 358—141 **17 Claims**



1. A signal processing apparatus in a television signal transmitting system, comprising:

a main signal generating means for generating a television signal as a main signal;

a multiplex signal generating means for generating a multiplex signal;

a signal separating means for separating the multiplex signal into first and second multiplex signals;

a time-multiplexing means for time-multiplexing said second multiplex signal and said main signal to obtain a time-multiplexed main signal;

a carrier generating means for generating a first carrier;

a first amplitude-modulating means for amplitude-modulating said carrier by said time-multiplexed main signal to obtain a first vestigial side band, amplitude-modulated signal;

a phase shifting means for shifting the phase of said first carrier by 90 degrees to obtain second carrier;

a second amplitude-modulating means for amplitude-modulating said second carrier by said first multiplex signal to obtain a double side band, amplitude-modulated signal;

an inverse Nyquist filter having a Nyquist characteristic for filtering said double side band, amplitude-modulated signal to obtain a second vestigial side band, amplitude-modulated signal;

an adding means for adding said first and second vestigial side band, amplitude-modulated signals to obtain a resultant multiplexed signal; and

a transmitting means for transmitting said resultant multiplexed signal.

4,985,770

FIELD DISCRIMINATING CIRCUITRY USEFUL IN LCD DISPLAYS

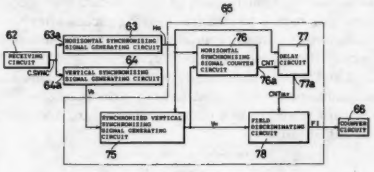
Nobuyoshi Nagashima; Toshio Matsumoto, both of Toenri; Shuhei Yasuda, Nara; Takafumi Kawaguchi, Nara, and Makoto Takeda, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 291,766, Dec. 29, 1988. This application Mar. 22, 1990, Ser. No. 497,220

Claims priority, application Japan, Dec. 29, 1987, 62-333972; Dec. 29, 1987, 62-333973; Sep. 5, 1988, 63-223020

Int. Cl.[5] H04N *5/04*

U.S. Cl. 358—152 **2 Claims**



1. A field discriminating device for supply of discriminating signals which enable first and second field times to be discriminated one from the other, through utilization of TV signals of an interlace mode, comprising:

a first circuit for generating horizontal synchronizing signals,

a second circuit for generating vertical synchronizing signals,

a third circuit for generating a pulse signal upon generation of an output pulse signal at the first circuit immediately after generation of an output pulse signal at the second circuit,

a counter circuit for counting the number of output pulses received from the first circuit which is initialized by the output signal from the third circuit,

a delay circuit for delaying an output signal from the counter circuit for one cycle of the horizontal synchronizing signals, and

a fourth circuit for detecting the output signal level of the delay circuit at the time of output signal generation at the third circuit,

a composite synchronizing signal based on the TV signals being applied to the input terminals of the first and second circuits, a field discriminating signal being outputted from the output terminal of the fourth circuit.

4,985,771

ANTI-RINGING DEVICE FOR TELEVISION TRANSMISSION SYSTEM

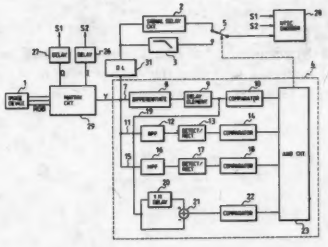
Yoshio Sugimori; Yoshihide Kimata; Tadao Kurosaki, and Joji Urano, all of Tokyo, Japan, assignors to Nippon Television Network Corporation, Tokyo, Japan

Filed Dec. 8, 1988, Ser. No. 281,368

Claims priority, application Japan, Dec. 31, 1987, 62-335048

Int. Cl.[5] H04N *5/14*

U.S. Cl. 358—160 **5 Claims**



1. An anti-ringing device for use in a television signal transmission system, comprising signal delay means for delaying a video signal obtained by an image device, a low-pass filter for changing a frequency band limitation characteristic of said transmission system, discrimination means for providing an output when a signal component of the video signal forming a source of ringing is detected thereby, and switch means for connecting an output of said signal delay means to a signal processor in a first, normal position and responsive to said output of said discrimination means for connecting said low-pass filter to said signal processor, instead of said delay means, in a second position, said delay means having a delay time corresponding to a signal processing time required in said discrimination means, wherein said discrimination means comprises first means for detecting a predetermined level change of a luminance signal of the video signal, second means for detecting an absence of intermediate frequency components indicative of details of the video signal, third means for detecting a ringing frequency component in the video signal, fourth means for detecting a high vertical correlation component of the luminance signal and an AND circuit responsive to outputs of said first, second, third and fourth means to provide an output for controlling said switch means to supply the output of said low-pass filter to said signal processor.

4,985,772

TELEVISION SIGNAL DECODER BYPASS SWITCH

Michael E. Long, Oak Brook, and Peter Stramello, Arlington Heights, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Sep. 12, 1989, Ser. No. 406,226

Int. Cl.[5] H04N *5/268*; H04B *11/16*

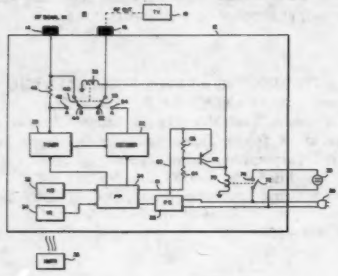
U.S. Cl. 358—181 **10 Claims**

1. Television signal processing means having a signal input terminal and a signal output terminal comprising:

decoder means having an input and an output, said output adapted to be coupled to said signal output terminal;

tuner means connected between said signal input terminal and said decoder means input; and

bypass switch means for selectively (a) connecting said signal input terminal to said signal output terminal while permitting reduced signal coupling to said tuner means



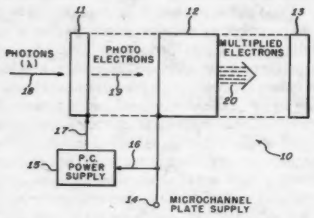
and (b) permitting full signal coupling to said tuner means and coupling said decoder means output to said signal output terminal.

4,985,773

APPARATUS AND METHOD FOR INHIBITING BLOOMING IN TELEVISION CAMERAS

Lawrence H. Gilligan, and Charles B. Ladd, both of Charlottesville, Va., assignors to Sperry Marine Inc., Charlottesville, Va.

Filed Jun. 28, 1989, Ser. No. 373,116
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—211 13 Claims



1. Apparatus for inhibiting blooming in a low-light level television camera utilized for viewing a scene, comprising

an input substrate at which blooming occurs in response to a bright light in said scene impinging on said substrate, and

means for applying periodic electrical pulses to said substrate,

each said pulse having an amplitute that terminates said blooming and a pulse duration that does not significantly reduce sensitivity of said camera, said pulses having a periodicity that permits said blooming to spread only up to a predetermined extent,

said low-light level television camera comprising an intensified television camera including an image intensifier, said image intensifier having an input photocathode, said input substrate comprising said input photocathode.

4,985,774

IMAGE SENSING DEVICE HAVING DIRECT DRAINAGE OF UNWANTED CHARGES

Tokuji Ishida; Toshio Norita, and Jun Hasegawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 19, 1989, Ser. No. 298,998
Claims priority, application Japan, Jan. 20, 1988, 63-10245; Feb. 10, 1988, 63-31381; Feb. 10, 1988, 63-31382; Feb. 10, 1988, 63-31383; Feb. 10, 1988, 63-31384; Feb. 10, 1988, 63-31385; Feb. 10, 1988, 63-31386; Feb. 10, 1988, 63-31387; Feb. 10, 1988, 63-31388; Feb. 10, 1988, 63-31389; Feb. 10, 1988, 63-31390; Feb. 10, 1988, 63-31391; Feb. 10, 1988, 63-31392; Feb. 10, 1988, 63-31393
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—213.19 7 Claims

1. An image sensing device, comprising:

light receiving means, having a plurality of light receiving elements, for receiving light of an image formed thereon to produce a plurality of electric charges corresponding to intensity of light received by said plurality of light receiving elements, respectively;

accumulating means, connected with said plurality of light receiving elements, for accumulating the plurality of electric charges produced by said light receiving means;

transferring means, including a shift register, for serially transferring the plurality of electric charges through said shaft register one by one through a single output terminal in synchronization with a predetermined transfer clock inputted repeatedly;

discharge means for discharging electric charges received;

first gate means, provided between said accumulating means and said transferring means, for simultaneously controlling the transference of the accumulated electric charges to said transferring means;

second gate means, provided between said transferring means and said discharge means, for simultaneously controlling the transference of the electric charges in said transferring means to said discharge means;

gate control means for controlling said first and second gate means so as to interrupt the transference of electric charges through said first and second gate means for performing the accumulation of said accumulating means, to permit the transference of electric charges through said first gate means to said transferring means after the accumulation of said accumulation mans is terminated, and to permit the transference of electric charges through said first and second gate means prior to commencement of the accumulation for discharging unnecessary electric charges stored in said accumulating means and said transferring means.

4,985,775

ELECTRONIC STILL CAMERA SYSTEM

Jin Murayama, and Ryuji Kondo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 945,987, Dec. 24, 1986, abandoned.
This application Feb. 13, 1989, Ser. No. 309,924
Claims priority, application Japan, Dec. 26, 1985, 60-292339
Int. Cl.[5] H04N *3/19*
U.S. Cl. 358—213.13 6 Claims

1. An electronic still camera system, comprising:

a dark box;

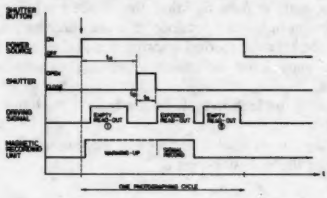
a focusing optical system in said box;

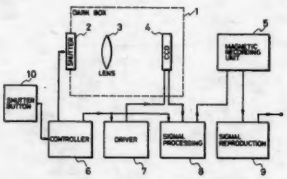
a solid-state image-pickup in said dark box having a plurality of charge storage elements;

a shutter in said dark box selectively passing light through said focusing optical system to said solid-state image-pickup element;

reading means for performing a first read operation for reading out for recordation signals from predetermined elements of said solid-state image-pickup following an exposure thereof by said shutter, said reading means per-

forming a second read operation for reading out residual charge from said predetermined elements of said solid-state image-pickup a predetermined time after said first





read operation prior to a next exposure of said solid-state image-pickup element, said shutter remaining closed during said predetermined time.

4,985,776

METHOD OF DRIVING SOLID-STATE IMAGING ELEMENT

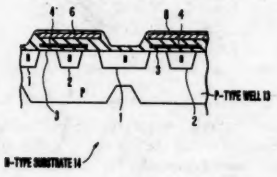
Yukio Taniji, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 22, 1989, Ser. No. 440,167

Claims priority, application Japan, Nov. 22, 1988, 63-296660

Int. Cl.[5] H04N *3/14, 5/335*

U.S. Cl. 358—213.23 **1 Claim**



1. A method of driving a solid-state imaging element which includes a semiconductor substrate formed of a first type of semiconductor material, and a well, of a second, different type of semiconductor material, formed on said semiconductor substrate, said imaging element further including an imaging region having a photoelectric conversion element formed in said well so as to provide a vertical-type overflow drain structure without a separately-formed overflow drain, a readout gate adjacent thereto, a vertical transfer register, and a storage region having a vertical transfer register and a horizontal transfer register, said method comprising the steps of:

driving said vertical transfer registers of said imaging and storage regions independently by different application pulses, said vertical-type overflow drain structure formed in said imaging region performing a clear operation of charges; and

performing an operation of transferring charges from said photoelectric conversion element to said vertical transfer register of said imaging region and an operation of clearing charges by discharging the charges to said vertical-type overflow drain structure a plurality of times within one field period.

4,985,777

CAMERA HAVING A FOCUS CONTROLLER CAPABLE OF FOCUSING IN HORIZONTAL AND VERTICAL DIRECTIONS OF AN IMAGE

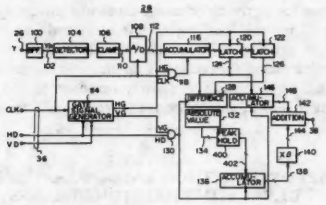
Yukihiro Kawada, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1989, Ser. No. 366,852

Claims priority, application Japan, Jun. 17, 1988, 63-147992; Nov. 8, 1988, 63-280304

Int. Cl.[5] H04N *5/232*

U.S. Cl. 358—227 **15 Claims**



1. A focus control apparatus of a camera for attaining a video signal representing an object field shot through a lens, comprising:

filter means for extracting a luminance signal component having a relatively high frequency from the video signal;

first accumulating means for accumulating the extracted luminance signal component with respect to a horizontal scanning line of the video signal:

differentiating means for attaining a difference in the accumulated luminance signal component between two horizontal scanning lines;

second accumulating means for accumulating the difference having a maximum value developed at least in a portion of a vertical scanning period of the video signal which is held for a predetermined period of time; and

control means for producing a control signal which controls the focus of the lens such that the accumulated value supplied from said second accumulating means becomes a maximum value.

4,985,778

COPYING APPARATUS CAPABLE OF DESIGNATING IMAGE AREAS

Naoki Ayata, Yokohama; Yasushi Sato, Kawasaki; Seiji Saito, Yokohama; Noboru Koumura, Narashino, and Motoharu Fujii, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 141,135, Jan. 6, 1988, abandoned, which is a continuation of Ser. No. 921,863, Oct. 22, 1986, abandoned, which is a continuation of Ser. No. 73,488, Sep. 7, 1979, abandoned. This application Sep. 13, 1989, Ser. No. 406,183

Claims priority, application Japan, Aug. 22, 1978, 53-117306; Sep. 12, 1978, 53-112111

Int. Cl.[5] H04N *1/21, 1/23;* **G03G** *21/00*

U.S. Cl. 358—296 **13 Claims**

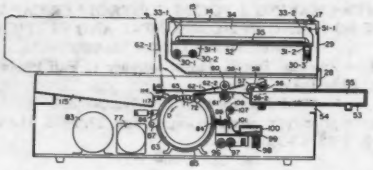
1. A copying apparatus comprising:

reading means for reading an original document image by a photoelectric converting member to generate electrical image signals;

storage means for storing information indicating a desired image area to be recorded on a recording medium, based

on the signals generated by said reading means prior to the original document reading;

output means for outputting a gate signal in accordance with the information stored in said storage means while said reading means is reading the original document;



gate means responsive to the gate signal from said output means for deriving from the electrical image signals generated by said reading means electrical image element signals corresponding to the desired image area; and

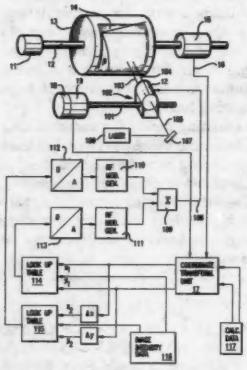
recording means for recording an image in the desired image area on a recording medium in response to said electrical image element signals derived by said gate means.

4,985,779

IMPROVED METHOD AND APPARATUS FOR GENERATING HALFTONE IMAGES

Winrich Gall, Klausdorf, Fed. Rep. of Germany, assignor to Intergraph Corporation, Huntsville, Ala.

Filed Sep. 19, 1989, Ser. No. 409,114
Int. Cl.[5] H04N *1/23, 1/40, 1/411*
U.S. Cl. 358—298 22 Claims



1. An improved method for generating a half-tone having a desired screen angle and screen frequency using a recording means having a radiation beam, of variable intensity, aimed at a target spot on a recording medium, the target spot being moved relative to the recording medium in first and second directions defining a first coordinate system,

wherein the recording medium is divided into a number of periodically repeating screen meshes forming a net on which locations are defined by a second coordinate system and wherein one of the coordinates of the second coordinate system is disposed at an angle β with respect to the first recording direction,

wherein each of these screen meshes is divided into a number of microdots, and

wherein the relative position of the target spot in any given mesh containing the spot is defined by relative second coordinates determined as a function of the spot's position in the coordinates of the first coordinate system

wherein the improvement comprises:

providing a lookup table that contains, at addressable locations, output data defining the desired intensity of the radiation beam as a function of input information, including the relative second coordinates and picture intensity data, such input information defining an address in the table,

addressing the lookup table on the basis of such information, and

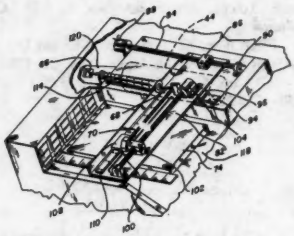
using the output data of the lookup table to affect the intensity of the radiation beam.

4,985,780

PORTABLE ELECTRONICALLY CONTROLLED LASER ENGRAVING MACHINE

Steven F. Garnier, Denver, and John Doran, Littleton, both of Colo., assignors to Melco Industries, Inc., Denver, Colo.

Filed Apr. 4, 1989, Ser. No. 333,102
Int. Cl.[5] B23K *26/04, 26/10*
U.S. Cl. 358—299 20 Claims



1. A laser engraving apparatus for engraving a stationary workpiece and in which the apparatus is able to be carried by the user and having an outlet for connection to a cable that communicates with an independent computer controller, comprising:

laser means for providing a laser beam;

beam delivery means including carriage assembly means movable in X and Y directions for positioning the laser beam;

support means for supporting a workpiece, wherein the workpiece is stationary during engraving thereof using said laser beam;

electronic means for controlling at least one of said carriage assembly and said laser beam during engraving of the workpiece; and

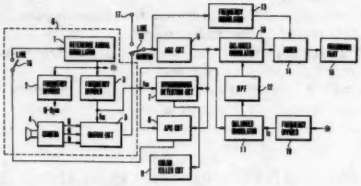
housing means for containing said laser means, said beam delivery means and said electronic means, said housing means including a length and a width forming a substantially rectangular shape and in which said laser means, beam delivery means, support means, electronic means and housing means together weigh less than about 75 pounds to provide a portable apparatus.

4,985,781

RECORDING AND/OR REPRODUCING APPARATUS IN WHICH A REFERENCE SIGNAL IS USED IN A RECORDING AND/OR REPRODUCING PART AS WELL AS IN ANOTHER PART

Masahide Hirasawa, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 34,831, Apr. 6, 1987, abandoned. This application Feb. 7, 1990, Ser. No. 478,048
Claims priority, application Japan, Apr. 15, 1986, 61-85085
Int. Cl.[5] H04N *9/80*
U.S. Cl. 358—324 5 Claims



1. A color video signal recording and/or reproducing apparatus comprising:

(a) a recording and/or reproducing part which records and/or reproduces a color video signal, said part including a frequency conversion circuit for converting a carrier frequency of a carrier chrominance signal included in said color video signal;

(b) a coupled part which is functionally coupled with said recording and/or reproducing part and performs a function other than recording and reproduction, said coupled part including a signal processing circuit for processing said carrier chrominance signal; and

(c) reference signal generating means which includes, an oscillation circuit arranged to produce an oscillation signal, a first frequency divider arranged to frequency divide said oscillation signal for producing a first reference signal which is used in said frequency conversion circuit and said signal processing circuit and has the same frequency as the color subcarrier frequency, and a second frequency divider arranged to frequency divide said oscillation signal for producing a second reference signal which has the same frequency as the carrier frequency of said carrier chrominance signal converted by said frequency conversion circuit, wherein said frequency conversion circuit includes a first balanced modulator which is arranged to perform a balanced modulating action on said first reference signal and said second reference signal and a second balanced modulator which is arranged to perform a balanced modulating action on an output signal of said first balanced modulator and said carrier chrominance signal.

4,985,782

REPRODUCTION SYSTEM CAPABLE OF REPRODUCING A STILL IMAGE BY INTERRUPTING A SEQUENCE OF RECORDED SIGNALS

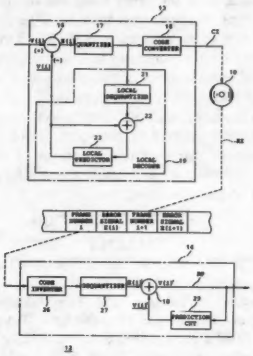
Toshio Koga; Junichi Ohki; Mutsumi Ohta, all of Tokyo, and Hideto Kunihiro, Osaka, all of Japan, assignors to NEC Corp. and NEC Home Electronics Ltd., both of, Japan

Filed May 2, 1988, Ser. No. 189,145
Claims priority, application Japan, Apr. 30, 1987, 62-108353
Int. Cl.[5] H04N *5/91*
U.S. Cl. 358—335 4 Claims

1. A reproduction system for use with a recording medium having stored therein a sequence of codes obtained by coding a sequence of predictive error signals which are derived from a sequence of moving images divisible into frames, said sequence of predictive error signals being produced by carrying out interframe predictive coding, said reproduction system reproducing said sequence of predictive error signals into a sequence of reproduced image signals and comprising:

error signal deriving means for deriving said sequence of predictive error signals in response to receipt of said sequence of said codes from said recording medium;

signal interrupting means receiving said sequence of predictive error signals and intermittently receiving a still image command signal, said signal interrupting means applying



said sequence of predictive error signals to reproducing means in response to the absence of said still image command signal and applying a constant signal to said reproducing means in response to the receipt of said still image command signal; and

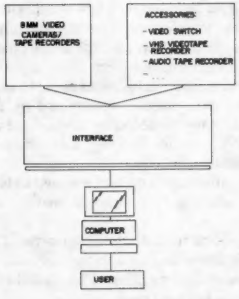
said reproducing means coupled to said signal interrupting means for reproducing a still image when it receives said constant signal and for reproducing said moving images when it receives said sequence of predictive error signals.

4,985,783

PILOTING INTERFACE FOR 8 MM VIDEO CAMERAS AND VTR'S AND ACCESSORIES, BY COMPUTER

Francis Falck, 6 rue de Schifflange, 67410 Drusenheim, France

Filed Apr. 17, 1989, Ser. No. 338,778
Claims priority, application France, Apr. 18, 1988, 88 05265
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—335 5 Claims



1. An interface which permits the remote control by computer of 8 mm video cameras and VTR's with a counter and remote control jack, and accessories such as a video switch, the pause function of a VCR or audio tape recorder which can be controlled by remote control, and generally all apparatus which can be electronically remote controlled, comprising a

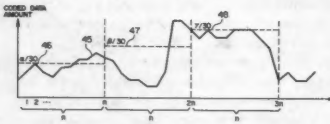
series/parallel-parallel/series electronic converter circuit which transforms on the one hand the series signal type RS232 from a computer into parallel signals or 8 or more bits, and on the other hand the parallel signals of 8 bits or more generated by a master card into a series signal type RS232 sent back to the computer, the whole of these parallel signals from this converter circuit being hereinafter called the interface command bus; a master card connected in a manner such that it receives on the one hand the bi-directional parallel signals from the command bus, and on the other hand the bi-directional series signals permitting the remote control and the decoding of the counters of 8 mm video cameras and VTR's; a video switching card connected to the command bus which permits the selection among different sources of video signals which are sent to a monitor, or television; a card constituted of exit interfaces connected to the command bus, and to the accessories, which permits the remote control by the appropriate jacks, and connectors, of one or more of the functions of the accessories connected to the interface as a result of the information sent by the computer to the command bus.

4,985,784

IMAGE DATA TRANSFER METHOD AND APPARATUS THEREFOR

Yukitoshi Tsuboi, Yokohama, and Teiji Okamoto, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1989, Ser. No. 305,702
Claims priority, application Japan, Feb. 5, 1988, 63-23673
Int. Cl.[5] H04N *5/76, 7/13*
U.S. Cl. 358—342 **28 Claims**



1. An image data transfer method comprising the steps of:
transforming an input video signal into image data through sampling and quantization;
coding said image data using a predetermined image coding method;
transferring the coded image data to a transmission medium;
decoding said coded data transferred by said transmission medium using a predetermined image decoding method; and
reproducing said decoded data into the original video signal;
wherein a data transfer speed for transferring coded image data to the transmission medium is selected such that the total coded data for said input video signal over a predetermined time duration becomes equal to or smaller than a transferable data amount determined by a data transfer speed at the time of decoding said coded data from said transmission medium and by said predetermined time duration; and
data transfer information on said selected data transfer speed is transferred to said transmission medium along with said coded data.

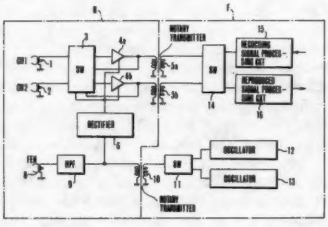
21. An image data reproduction apparatus, comprising:
an optical disc reproducing unit for reproducing coded data from a transmission medium of an optical disc, said optical disc reproducing unit comprising:
(a) an optical disc drive unit having a motor for driving an optical disc;
(b) an optical pickup device for reading data stored in said optical disc;
(c) a pre-amplifier for amplifying said data read out by said optical pickup device;
(d) a data processing circuit for processing the data outputted from said pre-amplifier to separate said data into coded data and data transfer speed information; and
(e) a servo control circuit which performs a servo control whereby said motor of said optical disc drive unit is controlled in accordance with said data transfer speed information outputted from said data processing circuit such that the data transfer speed for said data outputted from said pre-amplifier becomes equal to the value of said data transfer speed information; and
a moving image decoding unit for restoring an original video signal from said reproduced coded data, said moving image decoding unit comprising:
(a) a buffer memory for storing said coded data from said optical disc;
(b) an image decoding circuit for decoding said coded data stored in said buffer memory;
(c) a frame memory for storing image data from said image decoding circuit; and
(d) a D/A converter connected to said frame memory for converting said image data into a video signal.

4,985,785

ROTARY HEAD TYPE REPRODUCING APPARATUS

Hidetoshi Matsuoka, Hachioji, and Masahito Natsume, Matsudo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 320,791, Mar. 8, 1989, abandoned, which is a continuation of Ser. No. 925,303, Oct. 31, 1986, abandoned. This application Nov. 13, 1989, Ser. No. 436,101
Claims priority, application Japan, Nov. 11, 1985, 60-250903
Int. Cl.[5] G11B *15/12*
U.S. Cl. 360—62 **7 Claims**



1. A rotary head type recording and reproducing apparatus comprising:
(a) a fixed member which includes
(1) a recording signal processing means arranged to produce a recording signal,
(2) a recording signal processing means arranged to receive a reproduced signal, and
(3) an erasing signal producing means arranged to produce an erasing signal;
(b) a rotary member which includes
(1) a first rotary head for recording the recording signal on a recording medium in a recording mode and for reproducing signals for the recording medium to produce the reproduced signal in a reproducing mode,
(2) a second rotary head arranged to receive the erasing signal for erasing signals recorded on the recording medium in said recording mode, and
(3) amplifying means for amplifying the reproduced signal in said reproducing mode; and
(c) a rotary transmitter which includes
(1) a first channel arranged to transmit the recording signal from the fixed member to the rotary member in said recording mode, and arranged to transmit the reproduced signal from the rotary member to the fixed member in said reproducing mode, and
(2) a second channel arranged to transmit the erasing

signal from the fixed member to the rotary member in said recording mode, and arranged to transmit electrical power for driving said amplifying means from the fixed member to the rotary member in said reproducing mode.

4,985,786

APPARATUS FOR RETRIEVING INFORMATION PREVIOUSLY RECORDED ON RECORDING TAPE IRRESPECTIVE OF TAPE SPEED

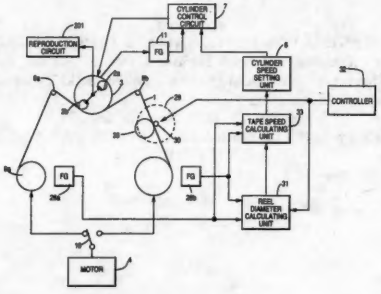
Kazuo Arai; Kiyoshi Ota, both of Hirakata, and Kouji Wakiyama, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 23, 1988, Ser. No. 274,815

Claims priority, application Japan, Nov. 30, 1987, 62-302228

Int. Cl.[5] G11B *5/52, 21/04*

U.S. Cl. 360—70 5 Claims



1. An information reproducing apparatus for reproducing information from a tape-shaped recording medium on which positional information of the recording medium is recorded in each of a plurality of slant information tracks, which apparatus comprises:

heads for reading out recorded information;

a rotary cylinder on which said heads are mounted;

a reproducing means for reproducing information recorded on said recording medium via said heads;

two reels around which said recording medium is wound;

a high speed tape drive means for running said recording medium at a high speed as compared with the speed at the time of recording by use of said two reels;

a tape speed detecting means for continuously detecting the running speed of said recording medium;

a cylinder speed setting means for setting a target speed value of said rotary cylinder for making constant the component of the speed of the heads at which the heads move in a track direction of the information tracks according to an output of said tape speed detecting means; and

a cylinder control means for controlling said rotary cylinder so as to adapt its rotation to said target speed value of said rotary cylinder set by said cylinder speed setting means.

4,985,787

MAGNETIC RECORDING APPARATUS FOR POSITIONING MAGNETIC HEAD TO TRACK ON MAGNETIC TAPE

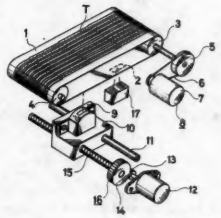
Shiego Kikuchi, Tagata, and Shinya Nakamura, Fujimidai, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1989, Ser. No. 293,664

Claims priority, application Japan, Jan. 8, 1988, 63-2081; Jan. 8, 1988, 63-2082

Int. Cl.[5] G11B *5/55*

U.S. Cl. 360—78.02 4 Claims



1. A magnetic recording apparatus for positioning a magnetic head to track on a magnetic tape comprising:

a tape drive means for causing a wide endless magnetic tape to revolve in a direction substantially along a longitudinal axis of a magnetic tape;

a carrier retaining a magnetic head in confronted relation with a magnetic tape for movement in a direction substantially orthogonal to the longitudinal axis of a magnetic tape;

a carrier motor drivingly connected to said carrier by a power transmission mechanism for converting a rotating motion of said carrier motor into a linear motion to be transmitted to said carrier, said power transmission mechanism including a screw rotated by said carrier motor and in threaded engagement with the carrier;

a home position mark having a length substantially equal to the sum of a length of a magnetic tape transported during a period from a start of said tape drive means to stabilization of its rotating speed plus a length of a magnetic tape transported during a period from a shut off of said tape drive means to its stopping, said home position mark being formed on said magnetic tape;

a detector means for optically detecting said home position mark thereby setting a stopping period of said tape drive means; and

discrete drive means for discretely driving said carrier motor at intervals of a predetermined period during one revolution of the magnetic tape except for a period during which said home position mark is detected to cause the magnetic head of said carrier to track along a magnetic tape in a single continous, substantially spiral track.

4,985,788

RECORDING AND REPRODUCING APPARATUS

Kiyoshi Kano; Nobuyuki Kaku, both of Yokohama; Tatsuya Shigemura; Yoshiyuki Tanaka, both of Katsuta; Yoshihiro Fukagawa, Yokohama, and Masaki Uesugi, Katsuta, all of Japan, assignors to Hitachi Video Engineering Inc., Kanagawa and Hitachi, Ltd., Tokyo, both of, Japan

Filed Oct. 18, 1988, Ser. No. 259,324

Claims priority, application Japan, Oct. 21, 1987, 62-263824; Oct. 21, 1987, 62-263823; Nov. 27, 1987, 62-297578

Int. Cl.[5] G11B *15/66*

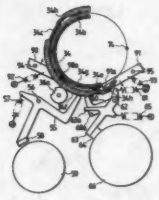
U.S. Cl. 360—85 8 Claims

1. In a recording and reproducing apparatus, a cam mechanism comprising:

a movable cam member having a first cam portion formed

on an edge of the cam member, a groove formed in a surface of the cam member, and a second cam portion formed on a wall of the groove, a depth of the second cam portion being not greater than a depth of the groove;

at least one guide member inserted into the groove of the cam member so as to guide the cam member along the at least one guide member during movement of the cam member;



a fist movable element disposed in contact with the first cam portion so as to move and follow a shape of the first cam portion during movement of the cam member; and

a second movable element disposed in contact with the second cam portion so as to move and follow a shape of the second cam portion during movement of the cam member.

4,985,789

SIGNAL RECORDING-REPRODUCING APPARATUS FOR USE WITH CASSETTE

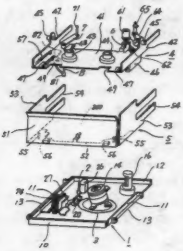
Yoshimi Kodama, Kobe, and Takefumi Tsuchida, Toyonaka, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 28, 1988, Ser. No. 250,274

Claims priority, application Japan, Oct. 2, 1987, 62-250200; Jan. 20, 1988, 63-11518; Feb. 10, 1988, 63-29376; Feb. 10, 1988, 63-29377; Feb. 19, 1988, 63-38289; Apr. 20, 1988, 63-96998

Int. Cl.[5] G11B *5/027, 5/008*

U.S. Cl. 360—85 **15 Claims**



1. A signal recording-reproducing apparatus for use with a cassette comprising:

a main chassis having thereon a cylinder device with a rotary head;

a reel chassis having a supply reel support and a takeup reel support thereon, said reel chassis is slidably provided on said main chassis and reciprocatingly movably disposed on the main chassis, said reel chassis is shaped to be accommodated inside the main chassis when moved to a position where the reel chassis is in an empty mode position;

a subchassis, for accommodating the cassette loaded on the reel chassis, said subchassis is provided on the main chassis and is slidable along the direction of movement of the reel chassis, the subchassis projecting from the reel chassis in a standby mode position to a position permitting loading of the cassette, the subchassis movable with the reel chassis when the reel chassis moves from the standby mode position to an empty mode position, the subchassis accommodated inside the reel chassis in the empty mode position;

movement guide means, provided on the main chassis and connected to the reel chassis, for moving the reel chassis

(i) to the standby mode position where the reel chassis is projected from the main chassis and projects away from the cylinder device,

(ii) to the play mode position where the reel chassis is positioned closer to the cylinder device than in the standby mode position, and

(iii) the empty mode position where the reel chassis is positioned closer to the cylinder device than in the play mode position; and

positioning means for placing the reel chassis in position for the standby mode position, the play mode position and the empty mode position, the cassette is loaded on the reel supports when the reel chassis is placed in the standby mode position, the cassette is positioned for recording or reproducing signals when the reel chassis is placed in the play mode position, the assembly of the main chassis and the reel chassis having an overall length, measured along the direction of movement of the reel chassis, which is shortest when the reel chassis is placed in the empty mode position which is shorter than when the reel chassis is in the standby and play mode positions.

4,985,790

MECHANISM FOR POSITIONING A TAPE CARTRIDGE

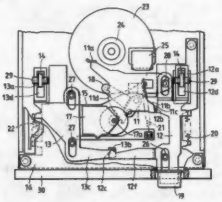
Fumito Komatsu, and Kenji Hirasawa, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Oct. 28, 1988, Ser. No. 263,858

Claims priority, application Japan, Oct. 30, 1987, 62-275237

Int. Cl.[5] G11B *5/008*

U.S. Cl. 360—96.5 **9 Claims**



1. A mechanism for positioning an insertable and ejectable tape cartridge in a tape drive device comprising:

reference surfaces for positioning the tape cartridge in a tape record and play position within said device;

a pair of positioning rollers for pressing the tape cartridge against said reference surfaces;

means including a lock member for selectively holding both of said rollers in a cartridge pressing position and in a cartridge pressing release position, said lock member including a lever movable in the tape cartridge inserting and discharging directions, and said lever having a wedge portion for maintaining both of said positioning rollers in the tape cartridge pressing position against said reference surfaces and a keeping portion for keeping said positioning rollers in the tape cartridge pressing release position;

retaining means for retaining said lock member in the cartridge pressing release position;

retaining releasing means for releasing the retaining means

when the tape cartridge is inserted to a predetermined position; and

biasing means for urging said lock member in a direction causing said rollers to press the tape cartridge against said reference surfaces.

4,985,791

CASSETTE LOADING DEVICE

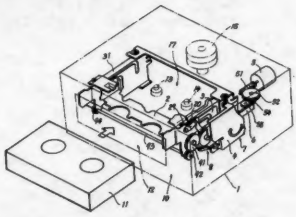
Hiromasa Yamagishi, Yao, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 24, 1989, Ser. No. 327,492

Claims priority, application Japan, Mar. 28, 1988, 63-74016; Jun. 17, 1988, 63-150576

Int. Cl.[5] G11B *5/008*

U.S. Cl. 360—96.5 **6 Claims**



1. A cassette loading device provided in a recording-reproduction apparatus for recording signals on a tape in a cassette or reproducing signals from the tape, the device being adapted to transport the cassette inserted into a cassette inlet to a recording-reproduction position, the cassette loading device being characterized in that the device comprises a cassette holder for holding the cassette as accommodated therein, a holder reciprocation guide mechanism provided along a path of travel of the holder formed on a chassis and extending from a cassette insertion waiting position to a loading completed position, a motor mounted on the chassis, and a power transmission system for transmitting power from the motor to the cassette holder, the power transmission system having incorporated therein a holder lock mechanism for locking the cassette holder in the loading completed position, the holder lock mechanism comprising a first rotary member rotatably driveable by said motor, a second rotary member for transmitting rotatable drive of said first rotary member to said cassette holder, a coupling member simultaneously engageable with said two rotary members for connecting said two rotary members to each other, and restricting means provided on said chassis and in engagement with said coupling member for restricting the movement of said coupling member, said restricting means having a first restricting portion for restricting movement of said coupling member from the start of cassette loading until said cassette is almost completely loaded causing said coupling member to connect said rotary members together for simultaneous rotation, and a second restricting portion for restricting the position of said coupling member when said cassette is completely loaded for preventing said second rotary member from rotating in a cassette unloading direction.

4,985,792

DISK DRIVE SPINDLE MOTOR WITH EXTERNALLY MOUNTED FLUX CONCENTRATOR RING

Michael B. Moir, Newbury Park, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Mar. 6, 1989, Ser. No. 319,527

Int. Cl.[5] G11B *17/02, 17/04*

U.S. Cl. 360—99.08 **16 Claims**

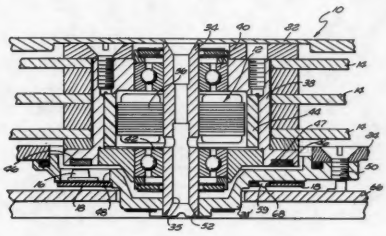
1. A disk drive spindle motor for use in a disk drive unit having at least one computer disk within a disk drive housing, said spindle motor comprising:

rotor means for rotatably supporting the at least one computer disk within the housing;

drive means for rotatably driving said rotor means;

a timing magnet carried by said rotor means for rotation therewith, said timing magnet being positioned generally at one axial end of said rotor means in relatively close running clearance with the housing;

a plurality of Hall sensors mounted within sensor ports



formed in he housing and in relatively close proximity with said timing magnet, said Hall sensors responding to moving magnetic fields associated with rotation of said timing magnet to control spindle motor commutation; and

a flux concentrator ring mounted on the exterior of the housing to substantially overlie and close the sensor ports, said flux concentrator ring focusing the moving magnetic fields associated with rotation of said timing magnet for passage through said Hall sensors.

4,985,793

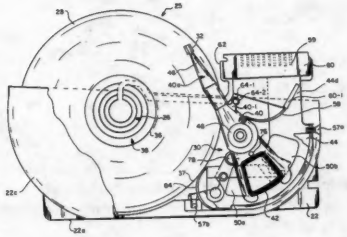
VOICE COIL ACTIVATED DISK DRIVE PARKING DEVICE WITH MAGNETIC BIAS

Kurt M. Anderson, Louisville, Colo., assignor to Conner Peripherals, Inc., San Jose, Calif.

Filed Nov. 10, 1988, Ser. No. 269,573

Int. Cl.[5] G11B *5/54*

U.S. Cl. 360—105 **13 Claims**



1. A parking device for a disk drive having a data storage medium, a transducer for reading information from and writing information to the data storage medium, and an actuator for selectively positioning the transducer with respect to the data storage medium, the actuator including a magnet for providing a magnetic field and an actuator coil mounted on the actuator arranged so that a current in said coil creates a force to pivot said actuator, comprising:

latch means, mounted in the disk drive to move between latched and unlatched positions, for engaging and parking the actuator when said latch means is in the latched position;

a magnetically permeable latch return, provided on said latch means in the magnetic field provided by the magnet,

for providing a biasing force to move said latch means to the latched positions; and

coil means, provided on the latch means, arranged so that a current in said coil means, in the magnetic field provided by the magnet, creates a release force of opposite direction with respect to said biasing force which moves said latch means to the unlatched position.

4,985,794

ROTARY DRUM DEVICE HAVING A HEAD DRIVE WITH POSITIVELY BONDED BOBBIN FIXING MEMBERS

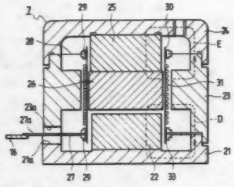
Naoki Kato; Toshiro Tsukahara; Satoshi Yanaura, and Kousuke Haraga, all of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,098

Claims priority, application Japan, May 26, 1988, 63-130570

Int. Cl.[5] G11B *5/53, 21/18*

U.S. Cl. 360—107 **8 Claims**



1. A head drive for a rotary drum device comprising:

a plurality of yokes made of magnetic material;

magnetic means housed in said yokes for forming a plurality of magnetic fluxes;

a bobbin, comprising a first material, surrounding said magnetic means;

a coil formed on said bobbin and covered with a second material;

at least one circular, non-magnetic leaf spring having an inner periphery and an outer periphery and being supported at said outer periphery or said inner periphery by at least one of said yokes and said magnetic means;

a prolongation at a portion of said outer periphery of said leaf spring;

fixing members, comprising a third material, positioned at said inner periphery of said leaf spring, said third material being positively dissolved and welded to at least one of said first material and said second material with a bonding solvent whereby said leaf spring supports said coil.

4,985,795

METHOD AND APPARATUS USING A STATIONARY MAGNETIC BODY FOR EFFECTING SIGNAL TRANSFERS BETWEEN A MOVING MAGNETIC CORE AND A MAGNETIC STORAGE MEDIUM

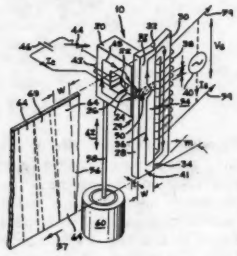
Beverley R. Gooch, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 843,453, Mar. 24, 1986, Ser. No. 829,592, Feb. 13, 1986, Ser. No. 715,211, Mar. 22, 1985, abandoned, Ser. No. 808,588, Dec. 13, 1985, abandoned, and Ser. No. 808,924, Dec. 13, 1985, abandoned, said Ser. No. 715,211, is a continuation-in-part of Ser. No. 641,817, Aug. 16, 1984, abandoned, said Ser. No. 829,592, is a continuation-in-part of Ser. No. 641,817, , said Ser. No. 843,453, is a continuation-in-part of Ser. No. 829,592, , Ser. No. 715,211, , Ser. No. 808,568, , and Ser. No. 808,924,. This application Aug. 6, 1987, Ser. No. 128,115

Claims priority, application PCT Int'l Appl., Dec. 15, 1986, PCT/US86/02734

Int. Cl.[5] G11B *5/187, 5/23, 5/52, 5/127*

U.S. Cl. 360—115 **49 Claims**



1. A magnetic transducer, comprising:

a magnetic core with poles defining a transducing gap therebetween;

a keeper of magnetic material extending in close proximity of said magnetic core to bridge said transducing gap;

means magnetically coupled to said magnetic core for providing a magnetic flux coupled from said core at said transducing gap to saturate a portion of said keeper in an area bridging said transducing gap to define a transducing region in said keeper; and

means for moving said magnetic core in closely spaced relationship with respect to said keeper to thereby vary the location of said transducing region in said keeper.

4,985,796

MAGNETIC HEAD WITH A TAPE CONTACTING SURFACE HAVING A METAL FILLED CHANNEL THEREIN

Keita Ihara; Hiroshi Yohda; Eisuke Sawai, and Ken Takahashi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 31, 1989, Ser. No. 359,312

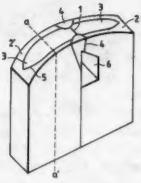
Claims priority, application Japan, Jul. 26, 1988, 63-185971

Int. Cl.[5] G11B *5/187*

U.S. Cl. 360—122 **2 Claims**

1. A magnetic head comprising a ring-like magnetic core composed of first and second magnetic core halves made of a ferrite and held in abutment against each other so as to form a magnetic gap therebetween and an elongated tape-contact surface extending across said magnetic gap, said magnetic core having a channel in said tape-contact surface, said channel extending across said magnetic gap and being filled with a magnetic metal material having a high-saturation magnetization which is directly adhered to said ferrite of said magnetic

core, said magnetic gap being surrounded by said magnetic metal material at said tape-contact surface and non-magnetic glass members provided at both ends of said magnetic gap to



determine a track width on a magnetic tape on which information is recorded by said magnetic head, the cross section of said magnetic gap being substantially oblong and said channel having a substantially V-shaped cross section.

4,985,797

MAGNETIC HEAD

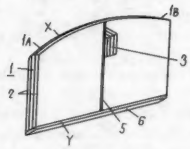
Hiroshi Yohda, Hirakata, and Yasushi Inoue, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 17, 1989, Ser. No. 326,042

Claims priority, application Japan, Mar. 23, 1988, 63-68590

Int. Cl.[5] G11B *5/147*

U.S. Cl. 360—126 **2 Claims**



1. In a ring-shaped magnetic head in which magnetic cores made of a metallic magnetic material are held between non-magnetic substrates, the improvement comprising a metallic thin film bridging the magnetic cores for establishing an electrical connection between the magnetic cores, the metallic thin film being formed on a surface of the magnetic head which is opposite to a surface for contacting a magnetic recording medium.

4,985,798

MAGNETIC TAPE CASSETTE HAVING IMPROVED DUST PROOFING

Shozo Onmori; Daisuke Takahashi, and Kengo Oishi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

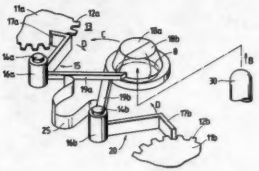
Filed Mar. 6, 1989, Ser. No. 318,866

Claims priority, application Japan, Mar. 11, 1988, 63-31697[U]; Mar. 25, 1988, 63-69850; Mar. 30, 1988, 63-40982[U]

Int. Cl.[5] G11B *23/087*

U.S. Cl. 360—132 **4 Claims**

1. A magnetic tape cassette housing a pair of tape winding bodies around which a magnetic tape is wound, the magnetic tape being pulled exteriorly of the cassette for recording and playback, comprising: a reel- brake for preventing angular movement of said tape winding bodies comprising two brake members each of which comprises an engaging pawl engageable with a gear portion formed on a flange of a respective one of said tape winding bodies, and an operating portion with which a brake release lever insertable into said cassette is in sliding contact so as to move said operating portions apart from each other to disengage said engaging pawls from the respective gear portions, said engaging pawls and said operating portions being formed on body portions of said two brake members, said body portions of said brake members being fitted on respective brake support shafts projecting from a bottom surface of said cassette and being angularly movable



thereon, said operating portions having a shape capable of substantially containing an end portion of said brake release lever, and inner wall surfaces of said operating portions being inclined toward closed positions thereof in the direction of insertion of said brake release lever.

4,985,799

DISK CARTRIDGE WITH IMPROVED DISK CLEANING

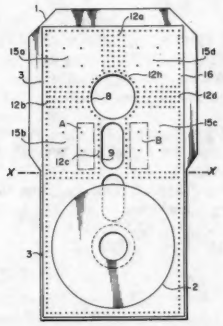
Hajime Doi, Ibaraki, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Oct. 5, 1988, Ser. No. 253,590

Claims priority, application Japan, Oct. 8, 1987, 62-252354; Oct. 8, 1987, 62-252355

Int. Cl.[5] G11B *23/033*

U.S. Cl. 360—133 **6 Claims**



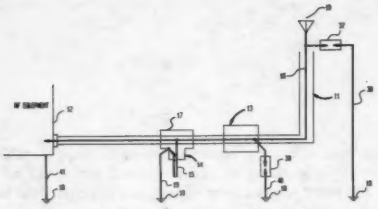
1. A disk cartridge for use in a recording and reproducing apparatus, comprising a disk cartridge casing including driving holes formed therein adapted to receive a disk drive shaft, a disk encased by said disk cartridge casing head access opening and a cleaning sheet welded to an inner surface of said disk cartridge casing, wherein the density of welding sites of said cleaning sheet to said casing in regions where said cleaning sheet undergoes pressure exerted by pressing members of said recording and reproducing apparatus is lower than higher density sites in regions or zones around said driving holes formed in said disk cartridge, said zones of high welding density being formed so as to extend from an outer circumference of said driving holes to a periphery of said disk cartridge casing in a first direction perpendicular to a second direction along which an imaginary line connects said driving hole to said head access opening.

4,985,800

LIGHTING PROTECTION APPARATUS FOR RF EQUIPMENT AND THE LIKE

Nathan W. Feldman, 910 Van Court Ave., Elberon, N.J. 07740, and Malvin L. Shar, 74 Tinton Ave., Eatontown, N.J. 07724

Filed Oct. 30, 1989, Ser. No. 428,792
Int. Cl.[5] H01P 5/00
U.S. Cl. 361—113 3 Claims



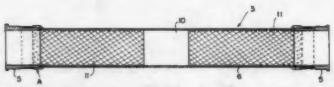
1. Lightning protection apparatus comprising
an antenna;
RF equipment coupled to said antenna;
a high pass filter serially coupled between said antenna and said RF equipment, said filter being operative to pass frequencies which are approximately at and above the operating frequency of said RF equipment and being a coaxial cylindrical capacitor having a capacitance distributed along the length thereof; and
a bandpass filter shunted across said RF equipment, said bandpass filter being operative to prevent frequencies which are below the operating frequency of said RF equipment from reaching said RF equipment and comprising a shorting stub having a length equal to one quarter of a wavelength of the operating frequency of said RF equipment.

4,985,801

TUBE FOR THE CIRCULATION OF A FLAMMABLE FLUID, AND CONDUIT MADE FROM SUCH TUBES

Guy Hellard, and Amour Bedes, both of Blagnac, France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

PCT No. PCT/FR88/00349, § 371 Date Feb. 7, 1989, § 102(e) Date Feb. 7, 1989, PCT Pub. No. WO89/00263, PCT Pub. Date Jan. 12, 1989
PCT Filed Jun. 30, 1988, Ser. No. 333,621
Claims priority, application France, Jul. 2, 1987, 87 09403
Int. Cl.[5] H05F 3/00
U.S. Cl. 361—215 7 Claims



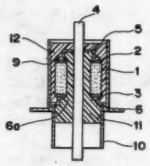
1. In a hose construction having an inside surface defining a passage for conveying a flammable fluid and a pair of hose connectors connected to opposed end portions of said hose construction, said hose connectors being in an electrically conductive material in order to be grounded, the improvement being in that said inside surface comprises:
a first electrically conductive portion electrically connected to one of said hose connectors;
a second electrically conductive portion electrically connected to the other of said hose connectors; and
an intermediate electrically insulating portion disposed between said first and second electrically conductive portions and electrically insulating said first electrically conductive portion from said second electrically conductive portion.

4,985,802

HIGH VOLTAGE THROUGH TYPE CAPACITOR AND MANUFACTURING METHOD THEREFOR

Katsunori Ueno, Osaka; Masayuki Aiga, Hyogo, and Masafumi Kuroda, Himeji, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Sep. 19, 1989, Ser. No. 409,474
Claims priority, application Japan, Sep. 20, 1988, 63-122915; Nov. 16, 1988, 63-290438; Nov. 17, 1988, 63-291429; Nov. 18, 1988, 63-292843; Nov. 18, 1988, 63-292846; Nov. 18, 1988, 63-292847; Nov. 24, 1988, 63-296932; Dec. 22, 1988, 63-324607
Int. Cl.[5] H01G 4/42, 7/00
U.S. Cl. 361—302 20 Claims



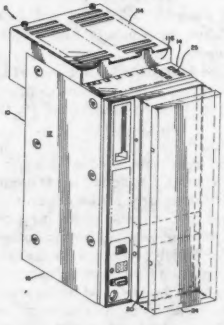
1. A high voltage through type capacitor comprising:
a cylindrical dielectric;
first and second electrodes formed on both end faces of said cylindrical dielectric;
a through conductor passing through said cylindrical dielectric in an axial direction thereof, said through conductor is electrically connected to said first and second electrodes; and
an insulating resin selected from the group of self-adhesive silicone rubber and elastic silicone gel, said insulating resin filled into a space defined at least between an inner surface of said cylindrical dielectric and said through conductor.

4,985,803

HOUSING FOR A MULTI-BOARD ELECTRONIC MODULE FOR A PROGRAMMABLE CONTROLLER SYSTEM

Frank W. Pum, Hales Corners, and Michael C. Szymaszek, Greendale, both of Wis., assignors to Square D Company, Palatine, Ill.

Filed Mar. 17, 1989, Ser. No. 325,411
Int. Cl.[5] H05K 7/20
U.S. Cl. 361—383 7 Claims



1. An electronic module of a programmable controller sys-

tem, said electronic module including a housing to enclose a plurality of electronic circuit boards, said housing comprising:

a rear wall, side walls, a top wall and a bottom wall cooperating to define an enclosure having an open front;

a cap enclosing a portion of said top wall and a portion of said rear wall, said cap adapted for wall mounting of said housing;

a removable cover closing said open front;

an electronic circuit board mounting means located in said housing for mounting said electronic circuit boards in a substantially vertical orientation;

vent openings in said top and said bottom walls,

said vent openings and said vertically oriented electronic circuit boards cooperating to permit air heated by components on said electronic circuit boards to escape said housing through said top wall vent openings and for permitting ambient air to enter said bottom wall vent openings, thereby replacing said escaping air and cooling said components on said electronic circuit boards.

4,985,804

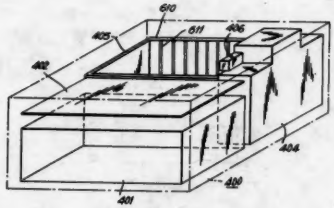
MICROCOMPUTER HOUSING AND VENTILATION ARRANGEMENT

W. Carroll Campbell; Michael W. Evans, both of Longmont; Edward A. Browning, Jr., Louisville, and Robert J. Stone, Longmont, all of Colo., assignors to Codar Technology, Inc., Longmont, Colo.

Division of Ser. No. 149,116, Jan. 27, 1988. This application Oct. 23, 1989, Ser. No. 425,246

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—384 **12 Claims**



1. A microcomputer system comprising a housing, a card cage, a power supply, a memory receptacle, means for mounting said memory receptacle in said housing, and a memory unit releasably mounted in said memory receptacle, said card cage and power supply being mounted laterally of one another and rearwardly of said memory receptacle in said housing, said housing having an apertured front cover and an apertured rear wall for the flow of air therethrough, said housing further having first and second opposed substantially unapertured side walls, and substantially unapertured top and bottom walls, said memory receptacle being without substantial front and rear surfaces whereby air may pass therethrough, and a main fan arrangement mounted in said housing which directs air in the front to back direction therein and from the memory receptacle through both the power supply and the card cage.

4,985,805

DEVICE FOR THE COOLING OF OPTOELECTRONIC COMPONENTS AND USE OF A FLANGE JOINT USED THEREOF

Wolfgang Riedel, Neuenburg; Richard Wissler, Freiburg; Otmar Fichter, March; Klaus Gregorius, Neunkirchen; Gerhard Mattauch, Kleinsendelbach, and Heinz Schorner, Röthenbach, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V. and Siemens Aktiengesellschaft, both of Munich, Fed. Rep. of Germany

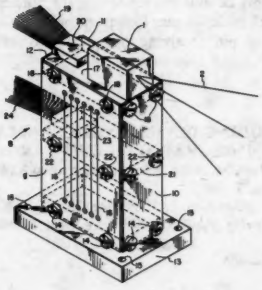
PCT No. PCT/DE87/00538, § 371 Date Jul. 21, 1988, § 102(e) Date Jul. 21, 1988, PCT Pub. No. WO88/04107, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 20, 1987, Ser. No. 237,736

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639881; Nov. 18, 1987, 3739085

Int. Cl.[5] H01L *25/04*

U.S. Cl. 361—386 **17 Claims**



1. An apparatus for the cooling of optoelectronic components such as infrared diode lasers and infrared detectors said apparatus comprising:

a base;

an evacuated cooler housing mounted on said base;

a cooling unit having a cooling unit housing and a cold station, said cooling unit extending into said evacuated cooler housing;

an elastic sealing means for sealingly coupling said cooling unit housing to said evacuated cooler housing;

at least one window in said evacuated cooler housing; and

a holding means within said evacuated cooler housing for mounting the optoelectronic components, said holding means including a flexible metal band thermally coupled with said cold station,

a thin-walled hollow body composed of thermally poor conducting material,

a retaining plate on one end of said hollow body, and

a retaining base rigidly connected to said base.

4,985,806

POWER SUPPLY STRUCTURE

Raymond Mazzullo, and Brian R. Van Zyl, both of Cape Town, South Africa, assignors to Multitech Systems (Proprietary) Limited, Cape Town, South Africa

Filed Oct. 6, 1989, Ser. No. 418,322

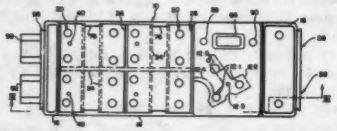
Claims priority, application South Africa, Oct. 14, 1988, 88/7685

Int. Cl.[5] H05K *7/00*

U.S. Cl. 361—392 **20 Claims**

1. A power supply structure which comprises a base member having a first power input connection, a plurality of first sets of plug pin receiving openings with first electrically conductive plug pin receiving sockets behind them, said first power input connection being electrically connected to said first electri-

cally conductive plug in receiving sockets behind said first sets of openings, a second power input connection, a plurality of second sets of plug pin receiving openings with second electrically conductive plug pin receiving sockets behind them, said second power input connection being electrically connected to said second electrically conductive plug receiving sockets behind said second sets of openings, the first and second sets of



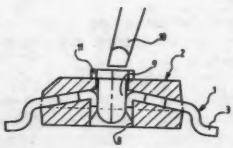
openings being grouped so that each first set is associated with a second set, (first means . . . the socket) said first input connection and said first electrically conductive sockets being electrically isolated from said second input connection and said second electrically conductive sockets, and a plurality of modules each of which includes pins for insertion into said sets of openings and plug pin receiving openings into which plugs on power leads can be inserted.

4,985,807

ENCODING DEVICE PARTICULARLY FOR INTEGRATED CIRCUIT CARDS

Daniel De Mari, Moissac, France, assignor to APR Composants, Montauban, France

Filed Sep. 1, 1989, Ser. No. 401,860
Claims priority, application France, Sep. 2, 1988, 88 11522
Int. Cl.[5] H01R 9/00
U.S. Cl. 361—405 **6 Claims**



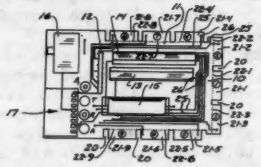
1. An encoding device, particularly for printed circuit cards, comprising a plurality of electrically conducting elements each adapted to connect at least two points of a printed circuit and adapted to be interrupted between these two points so as to establish a digital code condition according to whether said conducting elements are interrupted or not interrupted, said plurality of conducting elements being incorporated in a body made from an electrically insulating material so as to form a single encoding component, said insulating material body comprising, for each of said conducting elements, a corresponding cutout opening towards an exterior of the encoding component and traversed by said each corresponding conducting element and through which a first portion of said each corresponding conducting element is accessible from said corresponding exterior, said first portion of said each corresponding conducting element comprising a rupture zone allowing a rupture of said corresponding conducting element for programming said conducting element, wherein a conducting element which has been interrupted in said rupture zone and comprises two end portions separated from one another by said interruption, is adapted to be closed by introducing into said corresponding cutout opening, between said separated two end portions, an electrically conducting contact block said electrically conducting block including a head by which said conducting block is supported on an upper surface of said electrically insulating material body.

4,985,808

PRINTED CIRCUIT BOARD SWITCHING SYSTEM FOR RESISTOR NETWORK

Jeffrey P. Zernov, Baxter, Minn., assignor to Communications Systems, Inc., Hector, Minn.

Filed Nov. 2, 1988, Ser. No. 266,140
Int. Cl.[5] H01R 9/09
U.S. Cl. 361—406 **8 Claims**



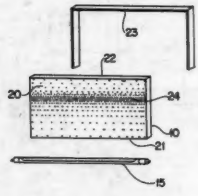
1. A printed wire board comprising a board member with conductors thereon, means defining a plurality of tabs extending from said board member adjacent at least one edge thereof, each of said tabs being joined to the board member through a break-line connection comprising intermittent openings and board portions between the opening extending along a breakaway line for each of the tabs, a plurality of tab conductors on each of said tabs, said tab conductors being joined to the board member conductors at different locations and each of said tab conductors spanning a respective breakaway line connection, whereby when a tab is permanently removed along the breakaway lines, the tab conductors spanning a respective breakaway line are broken.

4,985,809

SURFACE LIGHT SOURCE PANEL

Hirokazu Matsui, and Shinzo Murase, both of Otsu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Maytaku System, Shiga, both of, Japan

Filed Aug. 22, 1989, Ser. No. 396,625
Claims priority, application Japan, Aug. 23, 1988, 63-208670
Int. Cl.[5] F21V 7/04
U.S. Cl. 362—31 **11 Claims**



1. A surface light panel, comprising:
a transparent substrate,
a light source at one end of said transparent substrate;
a reflecting means at the other end of said transparent substrate; and
a plurality of diffused reflection sections on said transparent substrate;
wherein said diffused reflection sections are distributed on said transparent substrate such that the ratio of said diffused reflection sections per unit area of said transparent substrate sequentially increases the further said diffused reflection sections are from said light source up to a maximum area ratio position and decreases the closer said diffused reflection sections are to said reflecting means from said maximum area ratio position.

4,985,810

LIGHTED RUNNING BOARD ASSEMBLY

Edward Ramsey, 22615 S.R. 120, Elkhart, Ind. 46516

Continuation of Ser. No. 864,608, May 16, 1986, Pat. No. 4,819,136. This application Mar. 24, 1989, Ser. No. 328,468
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[5] B60Q *1/24*
U.S. Cl. 362—81 11 Claims

1. A lighted running board assembly for a vehicle, comprising, in combination:

an elongated running board having means defining stepped surfaces, at least one of said stepped surfaces having means defining an opening;

surface means defining an elongated water-tight tubular-shaped enclosure including a body having means defining a longitudinally extending cavity and an opening to said cavity, said enclosure further including a removable cover means for covering said opening;

a portion of said surface means being translucent in order to provide a light-passing lens;

mounting flange means integral with said body for mounting said body on said running board with said lens behind said opening in said one of said stepped surfaces;

each of said cover and body means having integral anchor means which mate with each other for positioning said cover over means said longitudinal extending opening to enclose said enclosure;

at least one lamp socket positioned within said cavity when said cover means is attached to said body;

a removable lamp mounted in each said lamp socket;

a plurality of anchor posts positioned within said cavity, said anchor posts being longitudinally distributed within said cavity; and

fastener means passing through said cover means for cooperative engagement with said anchor posts, said fastener means having means for engaging with said anchor posts to provide bearing pressure between said body and cover means along said anchor means whereby said fastener means, anchor posts and anchor means cooperate to provide a water-tight seal of the assembly during use and allows removal of said cover means for facile replacement of said lamp.

4,985,811

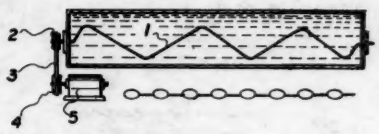
AQUA LIGHT

Mark W. Weiner, One University Pl. #11F, New York, N.Y. 10003

Filed Apr. 5, 1990, Ser. No. 504,841
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—101 4 Claims

1. An apparatus for projecting light images that simulate shimmering light comprising:

an enclosed liquid storage container having transparent walls and a liquid in said container, a wave bar held within said container, said bar comprising a series of bent portions so as to resemble a sine wave, said bar capable of revolving and capable of creating waves in said liquid, a



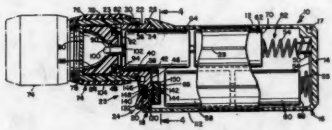
source of light located near said container and capable of shining light through said container.

4,985,812

WATERPROOF FLASHLIGHT WITH FINGER SWITCH

Alan K. Uke, 5980 Rancho Diegueno, Rancho Santa Fe, Calif. 92067

Continuation-in-part of Ser. No. 149,533, Jan. 28, 1988, Pat. No. 4,870,550. This application Jul. 20, 1989, Ser. No. 382,428
The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.
Int. Cl.[5] F21L *7/00*
U.S. Cl. 362—158 17 Claims



1. A flashlight for receiving batteries therein and adapted for underwater use, comprising:

a hollow casing being substantially oval in cross-section and having a closed rear end and a head receiving forward end, said head receiving end having first and second portions, said first portion having a hollow outwardly protruding cylindrical neck formed thereat and said second portion having an end wall formed thereat, said casing for receiving at least two parallel adjacent rows of batteries with at least one battery positioned in each row, and said neck substantially axially aligned with one of said battery rows and said end wall facing at least another one of said battery rows;

illumination means mounted upon said neck for, receiving electrical power from said batteries and generating light;

sealant means disposed between said illumination means and said neck for providing a watertight seal between said illumination means and said neck;

connection means for electrically connecting said illumination means to said batteries; and

switch means coupled to said connection means for selectively interrupting said electrical connection when said connection means electrically connects said illumination means to said batteries.

4,985,813

LIGHT FOR EMERGENCY USE

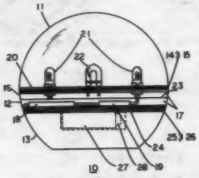
Gary W. Putman, P.O. Box 126, Greenleaf, Id. 83626

Filed Mar. 10, 1988, Ser. No. 166,543
Int. Cl.[5] F21L *1/00*
U.S. Cl. 362—186 5 Claims

1. A portable illuminated sphere means for illuminating environment comprising:

spherical container means, fabricated of high impact resistant material, for enclosing illumination means, said spherical container means including transillumination means;

illumination means disposed within said container means;
means for biasing said sphere for positioning said transillumination means;
an electrically operable switch for switching said illumination means on and off;



radio control means for remotely controlling the operation of said electrically operable switch, said radio control means further having means for controlling intermittent activation of said illumination means.

4,985,814

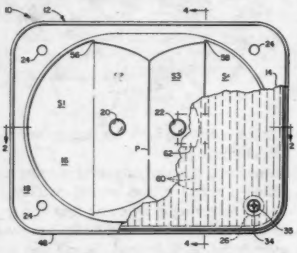
WARNING LIGHT WITH QUADRUPLE REFLECTIVE SURFACES

Harold W. Lyons, Killingworth, Conn., assignor to Whelen Technologies, Inc., Chester, Conn.

Continuation-in-part of Ser. No. 337,915, Apr. 14, 1989, abandoned. This application Jan. 19, 1990, Ser. No. 467,681

Int. Cl.[5] F21V *7/06*

U.S. Cl. 362—240 **11 Claims**



1. A dual emitter light assembly comprising:
reflector housing means comprising first and second laterally spaced socket means for mounting a light emitter, each said socket means having an associated concave reflector comprising first and second adjoining parabolic reflective surfaces, the parabolic reflective surfaces of each reflector having a common focal point lying on a central axis which extends through said socket means, said reflective surfaces each being a portion of a paraboloid of revolution about an axis extending between the focal point of the paraboloid and a vertex, the axis of at least one of said paraboloids of revolution being canted with respect to the axis of the paraboloid of revolution of the adjoining reflective surface so as to define substantially coplanar non-parallel directional axes of light emission of high intensity; and
a light emitter mounted in each of said socket means, said light emitters comprising single substantially point sources of light and being located on said common focal point.

4,985,815

LIGHT REFLECTOR

Nobuyuki Endo, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

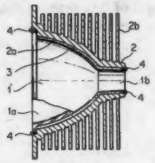
Filed Apr. 24, 1990, Ser. No. 513,733

Claims priority, application Japan, Nov. 29, 1989, 1-307749

Int. Cl.[5] F21V *29/00*

U.S. Cl. 362—294 **3 Claims**

1. A reflector for use in combination with a light source, comprising: a reflecting member having an inner surface for reflecting light emitted by the light source; a cooling frame having a hollow receiving the reflecting member therein and having a shape substantially conforming to the external shape



of the reflecting member, and externally provided with a plurality of heat radiating fins; and heat conductive material filling a space formed between the reflecting member and the cooling frame.

4,985,816

VEHICLE HEADLAMP

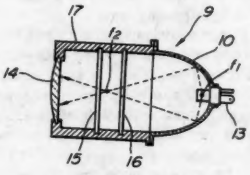
Yasutoshi Seko, and Tomoko Saito, both of Yokohama, Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Mar. 27, 1989, Ser. No. 329,226

Claims priority, application Japan, Mar. 28, 1988, 63-71906

Int. Cl.[5] F21V *7/00*

U.S. Cl. 362—303 **13 Claims**



1. A vehicle headlamp, comprising:
an ellipsoidal light reflector having first and second focuses;
a light source positioned at said first focus, so that light rays produced by said light source are reflected forward by said light reflector and converged at said second focus;
a converging lens positioned in front of said second focus;
a shading device positioned near said second focus for partially shading the light rays which have been reflected by said light reflector; and
control means for controlling the shading characteristic of said shading device,
wherein said shading device comprises a liquid crystal matrix which has a plurality of small light transmitting elements independently and electrically controlled by said control means.

4,985,817

SUPPORTING DEVICE FOR TROUBLE LIGHT

Paul-Aimé Yale, Chemin du Tour du Lac, Lac-des-Iles, Quebec J0W 1J0, Canada

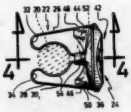
Filed May 7, 1990, Ser. No. 519,639

Int. Cl.[5] F21V *21/08*; F21L *15/14, 15/18*

U.S. Cl. 362—396 **8 Claims**

1. A supporting device for a trouble light having a tubular handle and a light socket axially extending from said handle, said device comprising:
a substantially flat plate member having a magnetized surface and a spring clip member projecting perpendicularly from said plate member in a direction opposite said magnetized surface, said clip member essentially consisting of

one continuous resilient wire disposed in a flat narrow plane diametrically crossing said plate member generally defining a M-shape in said plane, said M-shape having two lateral portions and an intermediate portion, said lateral portion being fixed to said plate member on its periphery, said intermediate portion defining a round recess between both of said lateral portions, said intermediate portion



leaving a narrowing gap adjacent the lateral portions for allowing access of said handle in said recess, said gap defining a distance smaller than the diameter of said round recess, whereby the introduction of said handle through said gap resiliently spreads the gap due the resiliency of the wire, the latter resiliently gripping the handle along said flat plane when located inside said recess, said magnetized surface adapted to rest on a magnetic surface.

4,985,818

DC VOLTAGE CONVERTER WITH FORMATION OF THE ACTUAL CURRENT VALUE

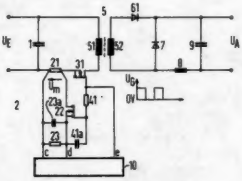
Hans Niederreiter, Massing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 29, 1990, Ser. No. 545,922

Claims priority, application European Pat. Off., Jun. 30, 1989, 89111982.8

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—19 **8 Claims**



1. In a switching DC voltage converter of the type having formation of the actual value of a current, in which a main power circuit comprises a first electronic switch and a current sensor in series therewith and traversed by ramp-shaped current pulses, the first electronic switch includes a control input connected to a control output of a control circuit that has a control input connected to the output of the circuit arrangement that forms the actual value of the current and controls the repetition rate and pulse duty factor of current pulses at its control output dependent on the actual value of the current in that the rising, momentary value of the ramp-shaped current pulse is compared to a reference value, the improvement therein comprising:

a second electronic switch in the circuit arrangement for forming the actual value connected between said current sensor and the output of said current arrangement, said second electronic switch including a control input connected to the output of the control circuit and controlled, dependent on the current-on pulse of the first electronic switch, to inhibit during current inrush of the current flowing through said current sensor and to conduct during the remaining time of the current pulse.

4,985,819

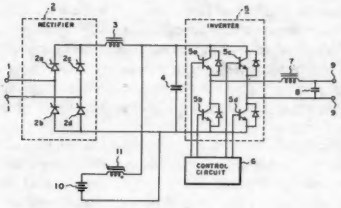
AC-DC-AC APPARATUS HAVING BATTERY CHARGING AND DISCHARGING FEATURE

Haruyoshi Mori, and Nobuo Sashida, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1989, Ser. No. 423,238

Int. Cl.[5] H02M *5/44*; H02J *7/00*

U.S. Cl. 363—37 **4 Claims**



1. An inverter apparatus comprising:

a rectifier which converts an AC voltage into a DC voltage and outputs the DC voltage;

an inverter which converts said DC voltage into an AC voltage and supplies the AC voltage to a load;

a battery which is connected in parallel to the DC voltage output side of said rectifier; and

a reactor which is connected in series to said battery, suppresses ripple components contained in a charging current when said battery is charged by the DC output of said rectifier, and is saturated with a discharging current having a value larger than a predetermined value when said battery is discharged.

4,985,820

DRIVER CIRCUIT FOR SWITCHING ON LAMP WITH LOW COLD RESISTANCE

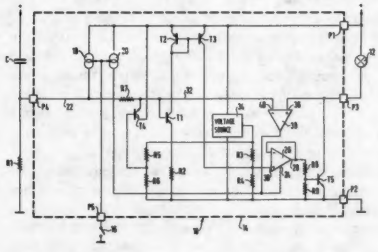
Anton Vorel, Eggenfelden, Fed. Rep. of Germany, assignor to Texas Instruments Deutschland GmbH, Fed. Rep. of Germany

Filed May 5, 1989, Ser. No. 347,973

Claims priority, application Fed. Rep. of Germany, May 6, 1988, 3815604

Int. Cl.[5] H02M *7/42*; H02H *7/122*

U.S. Cl. 363—49 **5 Claims**



5. A driver circuit for switching on a lamp with a low cold resistance comprising:

a power transistor having a collector-emitter path connected to the lamp in a series circuit lying between a positive terminal and a ground terminal of a supply voltage source;

an RC member comprising a resistor connected on one side to the ground terminal and a capacitor connected in series with said resistor and connected on one side to the positive terminal of the supply voltage source;

a current source circuit unit connected to a node intermediate said resistor and said capacitor for maintaining said capacitor in a discharged condition when the driver circuit is in a rest state;

comparator means having first and second inputs respectively connected to said resistor and the collector of said power transistor for comparing the voltage at said resistor with the voltage at the collector of said power transistor and providing at the output thereof a blocking signal when the voltage at said resistor is more negative than the voltage at the collector of said power transistor;

the output of said comparator means being operably connected to the base of said power transistor for rendering said power transistor non-conductive in response to the occurrence of a blocking signal at the output of said comparator means;

a voltage-limiting member interposed between said resistor and the first input of said comparator means for limiting the voltage at said resistor to a voltage value lying above the saturation value of said power transistor, said voltage-limiting member comprising a transistor;

a constant voltage source operably connected to the base of said transistor of said voltage-limiting member; and

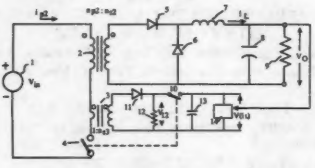
said transistor of said voltage-limiting member further having its emitter connected to a node intermediate said resistor and the first input of said comparator means.

4,985,821

INDIRECT CURRENT SENSING OF DC TO DC CONVERTERS

Itzchak Cohen, Dix Hills, N.Y., assignor to Lambda Electronics Inc., Melville, N.Y.

Filed Apr. 16, 1990, Ser. No. 509,897
Int. Cl.[5] H02M 7/44
U.S. Cl. 363—95 **8 Claims**



1. An indirect output current sensing system for DC converters employing power switches and having a load-current-carrying circuit and output terminals, comprising:

(a) means for sensing the current in the converter's power switches during their conduction period, the said means producing a sensing voltage having an instantaneous value indicative of the instantaneous value of the said current;

(b) capacitance means coupled to said sensing means;

(c) means for forcing the voltage across said capacitance means to follow said sensing voltage;

(d) means for decoupling said capacitance means from said sensing means at the end of the conduction period of the converter's power switches; and

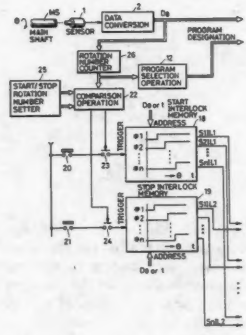
(e) means for providing a discharge current for said capacitance means during the non-conducting period of the converter's power switches such that the voltage across said capacitance means is indicative of the output current of said converter.

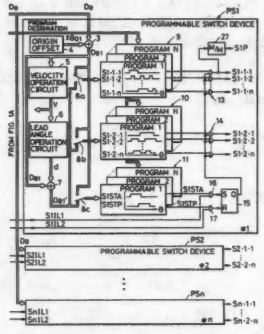
4,985,822

MULTISTATION SWITCH SYSTEM

Akira Yamashita, and Katsumi Teramoto, both of Tokyo, Japan, assignors to Kabushiki Kaisha SG, Tokyo, Japan

Filed Oct. 12, 1988, Ser. No. 256,698
Int. Cl.[5] G05B 19/06
U.S. Cl. 364—142 **13 Claims**





6. A multistation switching system for controlling a plurality of work stations comprising the combination of:

a master device for assuming different positions;

a position detector for determining the position of the master device;

a different programmable switch device associated with each of the plurality of work stations and responsive to the position detector for producing output signals therefrom to control operation of the associated station independently of the other stations; and

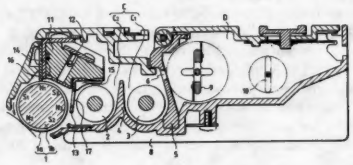
a common start/stop interlock device for controlling the output signals produced by each of the different programmable switch devices independently of the other programmable switch devices.

4,985,823

IMAGE-FORMING APPARATUS

Tatsuya Tada, Kawasaki, and Yasuyoshi Yamamoto, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1989, Ser. No. 401,623
Claims priority, application Japan, Aug. 31, 1988, 63-214802; Aug. 31, 1988, 63-214804; Aug. 31, 1988, 63-214805
Int. Cl.[5] G01D *15/10*
U.S. Cl. 346—160.1 12 Claims



1. An image forming apparatus comprising:

an image-bearing member;

latent image forming means for forming an electrostatic latent image on said image-bearing member;

developing means for developing said electrostatic latent image, said developing means including a developer chamber for accommodating a developer including toner and carrier, a toner chamber for accommodating said toner, toner supply means for supplying toner in said toner chamber to said developer chamber, a developer-conveying member for conveying developer supplied form said developer chamber to a developing section by bearing said developer on a surface of said developer-conveying member and a sensor for detecting the toner concentration in the developer; and

control means for controlling the supply of toner from said toner chamber to said developer chamber by using a detected toner concentration signal from said sensor, said control means supplying toner in a first mode when said detected toner concentration signal represents a toner concentration between a first toner concentration and a second toner concentration lower than said first toner concentration and supplying toner in a second mode different from said first mode when said detected toner concentration signal represents a toner concentration lower than said second toner concentration.

4,985,824

RELIABLE FUZZY FAULT TOLERANT CONTROLLER

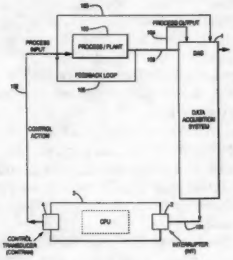
Abdo A. Husseiny, P.O. Box 1282; Enju Liang, 1800 Glendale Dr., #2, both of LaPlace, La. 70068, and Rodrigo Rodriguez, 733 Wright Ave., Gretna, La. 70056

Filed Oct. 30, 1987, Ser. No. 114,988
Int. Cl.[5] G06F *15/46*; G06G *7/00*
U.S. Cl. 364—187 9 Claims

1. A hybrid control system for a process comprising:

a first controller responsive to at least an output signal from the process to determine the instantaneous state of the process and provide an adaptive control of the process via a feedback control signal applied thereto;

a second controller responsive to said process output signal for determining (a) deviations of the output signal from a predetermined value and (b) rates of deviation of the output signal from the predetermined value and utilizing (a) and (b) to provide a fuzzy logic control signal for the process;



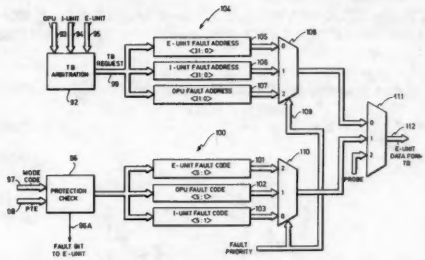
said second controller being a backup controller for said first controller in response to error or failure of the first controller.

4,985,825

SYSTEM FOR DELAYING PROCESSING OF MEMORY ACCESS EXCEPTIONS UNTIL THE EXECUTION STAGE OF AN INSTRUCTION PIPELINE OF A VIRTUAL MEMORY SYSTEM BASED DIGITAL COMPUTER

David A. Webb, Jr., Berlin; David B. Fite; Ricky C. Hetherington, both of Northboro; Francis X. McKeen, Westboro; Mark A. Firstenberg, Maynard; John E. Murray, Acton; Dwight P. Manley, Holliston; Ronald M. Salett, Framingham, and Tryggve Fossum, Northboro, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 3, 1989, Ser. No. 306,866
Int. Cl.[5] G06F *9/38, 11/30, 12/10*
U.S. Cl. 364—200 11 Claims



1. A method of processing memory access exceptions encountered during pipelined instruction execution in a virtual memory-based computer system, said instruction execution being performed by using an instruction pipeline having a plurality of pipeline stages, each of said pipeline stages being dedicated to performing a predefined one of several tasks into which an instruction is divided, said computer including an instruction unit (I-Unit) for fetching and decoding instructions and fetching instruction operands, an execution unit (E-Unit) for performing specified operations upon instruction operands, a system memory indexed by physical addresses, and a memory unit (M-Unit) including a translation buffer for converting virtual addresses delivered by the I- and E-Units to physical addresses within the system memory, said pipeline stages including an execution stage in the E-Unit, and preceding pipeline stages in the E- and I-Units which require virtual-to-physical address translations prior to instruction execution in the execution stage in order for one of the preceding pipeline stages to send valid results of said address translation down said instruction pipeline and through an intermediate one of the

preceding pipeline stages which processes said valid results before said valid results reach said execution stage, said method comprising the steps of:

receiving memory access requests, including memory read or write operations, from said preceding pipeline stages in said E- and I-Units which require virtual-to-physical address translations;

using said translation buffer to translate virtual addresses accompanying a memory access request into corresponding physical address;

checking said virtual addresses and the results of said address translation to determine presence of one or more of a predefined set of memory access violations; generating fault information and invalid results in response to said presence of one or more of the predefined set of memory access violations;

pipeline selected segments of said fault information and said invalid results along said instruction pipeline from said preceding pipeline stages to said execution stage; and

detecting the presence of said pipelined segments of fault information when said pipelined segments of fault information reach said execution stage, and in response thereto invoking a predefined exception handler routine corresponding to the memory access violation associated with said detected fault information so that the invocation of said exception handler routine is delayed past time that said one of said preceding pipeline stages sends said invalid results down said instruction pipeline and past the time that said invalid results pass through said intermediate one of said preceding pipeline stages.

4,985,826

METHOD AND DEVICE TO EXECUTE TWO INSTRUCTION SEQUENCES IN AN ORDER DETERMINED IN ADVANCE

Björn E. R. Jonsson, Järfälla; Sten E. Johnson, Huddinge; Lars-Örjan Kling, Södertälje, and Oleg Avsan, Huddinge, all of Sweden, assignors to Telefonaktiebolaget L. M. Ericsson, Stockholm, Sweden

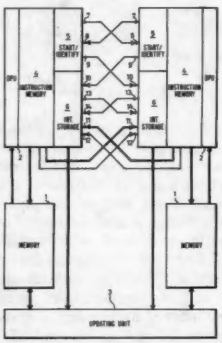
PCT No. PCT/SE87/00438, § 371 Date May 10, 1988, § 102(e) Date May 10, 1988, PCT Pub. No. WO88/02514, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 28, 1987, Ser. No. 192,512

Claims priority, application Sweden, Oct. 3, 1986, 8604222

Int. Cl.[5] G06F *9/38*

U.S. Cl. 364—200 **6 Claims**



1. A method of operating computer means to enable the computer means to execute a first and a second instruction sequence, said computer means comprising an auxiliary memory means and a first and second memory for storing the first and second instruction sequences, each memory comprising a plurality of memory locations accessible by an address, execution of the first and second sequences including selection of at least one read instruction and selection of at least one write instruction, said at least one read instruction comprising a read address for retrieval of data stored in one of said memory locations each accessible by its address in said first and second memories, respectively, and said at least one write instruction comprising a write address and data, said write address specifying a memory location to which the data is to be transferred, wherein data used in conjunction with the execution of the second sequence is not necessarily independent of data obtained in conjunction with the execution of the first sequence, said method comprising the steps of:

executing instructions in both sequences independent of a predetermined order of execution of the sequences;

upon encountering a read instruction during the execution of the second sequence, storing the read address of said read instruction encountered during the execution of the second sequence in said auxiliary memory means, if this address has not previously been selected in conjunction with execution of a write instruction in the second sequence;

upon encountering a write instruction during the execution of the first sequence, comparing each read address stored in said auxiliary memory means and the address of said write instruction encountered during the execution of the first sequence; and

re-executing the instructions in the second sequence responsive to the comparing step if the address of said write instruction encountered during the execution of the first sequence is any read address stored in said auxiliary memory means.

4,985,827

COMPUTER FOR SYNCHRONIZED READ AND WRITE OF VECTOR DATA

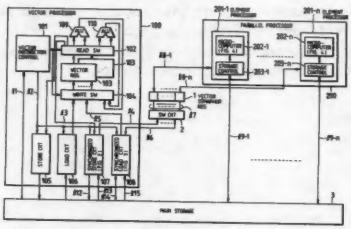
Naoki Hamanaka; Teruo Tanaka, both of Tokyo; Koichiro Omoda, Kanagawa; Shigeo Nagashima, Tokyo; Junji Nakagoshi, Tokyo, and Kazuo Ojima, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 226,376

Claims priority, application Japan, Jul. 29, 1987, 62-187529

Int. Cl.[5] G06F *12/00*

U.S. Cl. 364—200 **14 Claims**



1. A computer comprising:

(a) a main storage;

(b) a writing means responsive to at least one first program instruction for writing a group of ordered data elements designated by the first program instruction into arbitrary locations within said main storage;

(c) a reading means responsive to at least one second program instruction for reading said group of data elements from said main storage; and,

(d) an access controlling means connected to said writing means and said reading means and responsive to the at least one first instruction and the at least one second instruction for controlling access by said reading means to inhibit said reading means from trying to read each data element among said group of data elements before the

each data element has been written by said writing means, said controlling means including:

a register for holding status signals each of which indicates whether a corresponding one of said group of data elements has been written into said main storage, irrespective of the locations within said main memory in which the group of data elements are written;

a first means connected to said register and responsive to the at least one register and responsive to the at least one first instruction for writing status signals that respectively represent completion of writing each corresponding data element of the group of data elements into a corresponding position of said register, in synchronism with completion of writing of the corresponding data element onto said main storage by said writing means and irrespective of location within said main memory in which the group of data elements is written; and

a second means connected to said register and to said reading means and responsive to the at least one second instruction for inhibiting the reading means for reading each element of the group of data elements until the status signal is stored in said register for the corresponding data element.

4,985,828

METHOD AND APPARATUS FOR GENERATING A REAL ADDRESS MULTIPLE VIRTUAL ADDRESS SPACES OF A STORAGE

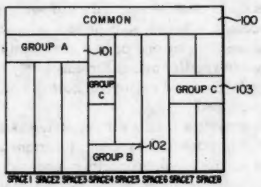
Naohiko Shimizu, and Hideo Sawamoto, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,454

Claims priority, application Japan, Mar. 19, 1987, 62-65424

Int. Cl.[5] G06F *12/10*

U.S. Cl. 364—200 **14 Claims**



1. A method of generating a real address in multiple virtual address spaces of a storage having multiple virtual storage spaces, an address translation table for each virtual address space to translate a logical address to a real address, an address control register for storing a start address of the address translation table or a virtual address space identifier, and an address translation buffer capable of storing copies of entries contained in the address translation table, said method comprising the steps of:

providing group identifiers in each of the entries in said address translation table, said address translation buffer and the entry in said address control register for identifying a respective area shared by a specific group of virtual spaces;

determining whether there is at least one entry in the address translation buffer whose logical address and address translation table start address conform with the logical address supplied for a memory request and the address translation table start address in said address control register, or whether an entry exists in the address translation buffer whose logical address and group identifier conform to the logical address supplied for memory access and the group identifier of said address control register; and

if there is at least one conformity, identifying the real address of said entry as a valid real address for memory access.

4,985,829

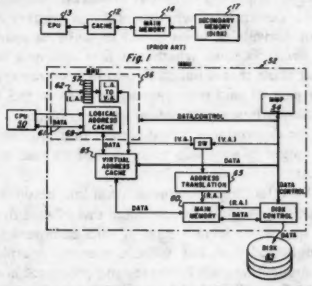
CACHE HIERARCHY DESIGN FOR USE IN A MEMORY MANAGEMENT UNIT

Satish M. Thatte, Richardson, and Donald W. Oxley, Carrollton, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 636,190, Jul. 31, 1984, abandoned. This application Jun. 26, 1987, Ser. No. 68,788

Int. Cl.[5] G06F *12/10*

U.S. Cl. 364—200 **4 Claims**



1. A memory system for use with a CPU comprising:

a physical memory;

binding register means having a plurality of registers and coupled between the physical memory and the CPU for constraining the CPU to access only a logical address space with logical addresses generated by the CPU, wherein a logical address includes a reference to one of the plurality of registers;

a logical address cache coupled to said binding register means for receiving logical addresses, and for providing selected information cached therewithin to the CPU if information corresponding to said logical address is stored in said logical address cache;

means coupled to said binding register means for determining whether information corresponding to said logical address is not contained in said logical address cache, and for translating logical addresses into virtual addresses contained in a virtual address space;

a virtual address cache to which virtual addresses are applied when said determining means determines that said logical address is not contained in said logical address cache, wherein said virtual address cache determines whether information corresponding to such applied virtual addresses is stored therein and which provides such information if it is stored in said virtual address cache; and

a virtual address cache controller coupled to said virtual address cache and to said physical memory for determining whether information corresponding to a translated virtual address is contained in said virtual address cache, and for copying information from said physical memory to said virtual address cache if information corresponding to a translated virtual address in not contained in said virtual address cache.

4,985,830

INTERPROCESSOR BUS SWITCHING SYSTEM FOR SIMULTANEOUS COMMUNICATION IN PLURAL BUS PARALLEL PROCESSING SYSTEM

Robert Atac, Aurora; Mark S. Fischler, Warrenville, and Donald E. Husby, DeKalb, all of Ill., assignors to Universities Research Association, Inc., Washington, D.C.

Filed Sep. 27, 1988, Ser. No. 249,694

Int. Cl.[5] G06F *13/364, 13/14, 13/42, 15/16*

U.S. Cl. 364—200 **2 Claims**

1. In a computer system having multiple processors with each of the processors linked to a bus switch and also having a branch bus linking at least two bus switches, means for effect-

ing multiple simultaneous communication links between processors comprising:

means for generating a request for a communication path from a first processor to a second processor, said request received by a first bus switch via a first source spigot and accompanied by a bus address of said second processor;

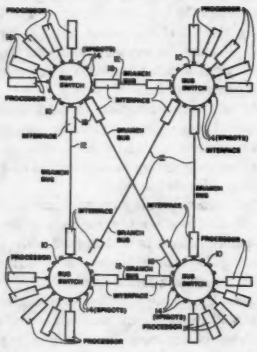
means associated with said first bus switch for detecting said request and for identifying a first primary destination spigot of said first bus switch that if linked to said first source spigot could form part of said communication path;

means for determining whether said first primary destination spigot is available to be linked to said first source spigot;

means for indicating whether a first alternate destination spigot exists that if linked to said first source spigot could form part of said communication path in the event that said first primary destination spigot is busy;

means for determining whether said first alternate destination spigot is available to be linked to said first source spigot;

means for effecting a communication link between said first source spigot and a first selected one of said first destination spigots to form a part of said communication path through said first bus switch, thereby completing said communication path if said second processor is connected to said first selected destination spigot;



means for communicating said request and said bus address of said second processor to a second bus switch via a branch bus linking said first and second bus switches which could form a part of said communication path, said request and bus address received by said second bus switch via a second source spigot;

means associated with said second bus switch for detecting said request and for identifying a second primary destination spigot of said second bus switch that if linked to said second source spigot could form part of said communication path;

means for determining whether said second primary destination spigot is available to be linked to said second source spigot;

means for determining whether said second alternate destination spigot is available to be linked to said second source spigot; and

means for effecting a communication link between said second source spigot and a second selected one of said second destination spigots to form a part of said communication path through said second bus switch, thereby completing said communication path if said second processor is connected to said second selected destination spigot.

4,985,831

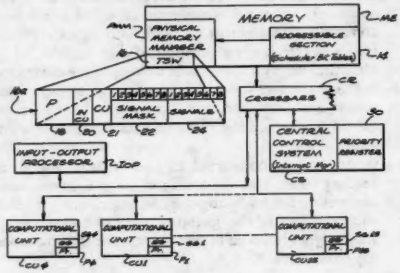
MULTIPROCESSOR TASK SCHEDULING SYSTEM

Carole Dulong; Jean-Yves Leclerc, both of Los Altos, and Patrick Scaglia, Saratoga, all of Calif., assignors to Evans & Sutherland Computer Corp., Salt Lake City, Utah

Filed Oct. 31, 1988, Ser. No. 265,372

Int. Cl.[5] G06F 9/46

U.S. Cl. 364—200 **14 Claims**



1. A task scheduling system for use to synchronize the execution of tasks in a multiprocessor, the multiprocessor cooperatively including a plurality of computational units, a memory, a control means and an input-output processor, and wherein tasks are initiated for execution in said multiprocessor and task signals involved in the execution of tasks are received and specified, said task scheduling system comprising:

means operating in association with said memory for receiving and storing a plurality of task status words, said task status words identifying the status of certain of said task signals, and a present location of a task with respect to said multiprocessor, wherein said present location may comprise said memory or one of said computational units;

task status word register means for selectively receiving task status words from said means for storing a plurality of task status words; and

interpretative control means for supplying said task signals in said multiprocessor to specific locations in said multiprocessor for task synchronization under control of said task status word as stored in said task status word register.

4,985,832

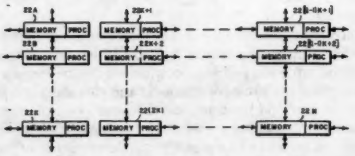
SIMD ARRAY PROCESSING SYSTEM WITH ROUTING NETWORKS HAVING PLURALITY OF SWITCHING STAGES TO TRANSFER MESSAGES AMONG PROCESSORS

Robert S. Grondalski, Maynard, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 18, 1986, Ser. No. 909,013

Int. Cl.[5] G06F 3/00, 9/00, 11/00, 15/16

U.S. Cl. 364—200 **42 Claims**



1. A routing network for transferring messages, each message including an address and data, among a plurality of processing elements in an array processing system, said routing

network comprising: I. a series of initial switching stages each including:

A. a plurality of switching elements, each comprising a plurality of output terminal groups, each group comprising a plurality of output terminal means, each output terminal group being identified by a decoding of a selected portion of an address;

B. a plurality of data lines each connected to an output terminal means, wherein all of said data lines, from each said switching element in said switching stage, connected to said output terminal means belonging to said output terminal group identified by the same said address decoding, are also connected to the same switching element in the next switching stage;

C. circuit means for receiving a message and coupling it onto a selected one of said data lines, said circuit means including:

i. input circuit means for receiving an input message and having an address output terminal for transmitting said address and a data output terminal for transmitting said data;

ii. a plurality of address control circuits for decoding the address from the address output terminal of said input circuit means, each address control circuit generating an address enabling signal in response to a predetermined encoding of the address;

iii. a plurality of coupling means groups each connected to an address control circuit for receiving an enabling signal therefrom, each coupling means group including a coupling means each connected to a data line, one of said coupling means within a coupling means group coupling said data from said input circuit means onto a data line in response to the receipt of said address enabling signal from said address circuit means; and II. a crossbar switch stages for receiving messages from the output terminal groups of the last of the series of initial switching stages, for performing a switching operation in connection with the messages, and for coupling the switched messages to the processing elements.

4,985,833

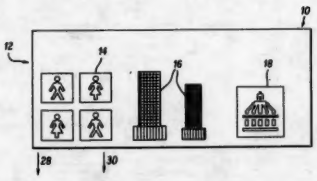
EXTENDED COVERAGE MONETARY REGULATION SYSTEM

John E. Oncken, Austin, Tex., assignor to First City, Texas- N. A., Austin, Tex.

Continuation-in-part of Ser. No. 235,490, Aug. 24, 1988, abandoned. This application May 7, 1990, Ser. No. 520,837

Int. Cl.[5] G06F *15/21*

U.S. Cl. 364—408 **14 Claims**



9. An extended coverage monetary regulation system comprising:

A. a central transaction control center for receipt, disbursement, and insurance of a plurality of individual account funds in unlimited amounts;

B. means for receiving individual account funds from individuals, business, and governmental entities and for disbursing funds from said accounts only to agreed upon financial institutions while providing daily monitoring of balances in said financial institutions, monthly accounting of funds deposited and withdrawn and interest earned, and annual tax reporting;

C. processing means for processing said individual account funds in commingled form so that a plurality of insured financial institutions receive portions of said commingled individual account funds and so that each financial institution receives less than a maximum amount of each of said individual account funds;

D. means for ensuring that said plurality of financial institutions are prohibited from receiving information concerning the identity and amounts of said individual account funds received in commingled form so that said financial institutions deal with one fluctuating lump sum only;

E. means for monitoring each of said individual account funds so that upon receipt of a deposit at said central control center, a deposit is received by said financial institution that, after said deposit, maintains less than a maximum amount of said individual account funds; and

F. means for monitoring each of said financial institutions so that as a total number of withdrawals from each of said financial institutions commingled individual account funds reaches one less than a maximum number, one final withdrawal is made reducing a balance of said individual account funds to zero and transferring said balance to financial institutions with more than one less than a maximum number of withdrawals available.

4,985,834

SYSTEM AND METHOD EMPLOYING PIPELINED PARALLEL CIRCUIT ARCHITECTURE FOR DISPLAYING SURFACE STRUCTURES OF THE INTERIOR REGION OF A SOLID BODY

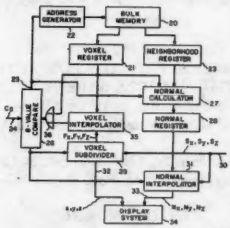
Harvey E. Cline; Richard I. Hartley, both of Schenectady; Siegwalt Ludke, Scotia, and Sharbel E. Noujaim, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 22, 1988, Ser. No. 275,154

The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.

Int. Cl.[5] G06F *15/42*

U.S. Cl. 364—413.22 **22 Claims**



1. A system for displaying two-dimensional images of internal surfaces of three-dimensional solid bodies, comprising:

means for storing three-dimensional signal patterns representing the value of at least one physical property associated with a three-dimensional body at regularly spaced grid locations defining volume voxel elements within said body;

means for selectively accessing an entire voxel of values, represented by said signal patterns, from said storing means at one time;

parallel circuit means for testing said voxel values, as defined by vertex values, for intersections of said voxel with a preselected internal surface of said three-dimensional body;

parallel circuit means for subdividing only intersected voxels into sub-voxels;

parallel circuit means for testing values of each of said sub-voxels for intersections of said each sub-voxel with said preselected surface;

parallel circuit means for determining sub-voxel normal values only for those sub-voxels intersected by said preselected surface; and

display processor means for receiving sub-voxel coordinates and sub-voxel normal values, and for displaying said normal values on a screen, said displayed values representing an image of said preselected surface.

11. A method for displaying two-dimensional images of internal surfaces of three-dimensional solid bodies, comprising:

storing three-dimensional signal patterns representing the value of at least one physical property associated with a three-dimensional body at regularly spaced grid locations defining volume voxel elements within said body;

selectively accessing an entire voxel of said values, represented by signal patterns, from said storing means at one time;

testing a plurality of said voxel values, as defined by said vertex values, in parallel for intersections of said voxel with a preselected internal surface of said three-dimensional body;

subdividing only intersected ones of said voxels into a plurality of sub-voxels in parallel;

testing values of each of said sub-voxels, simultaneously and in parallel, for intersections of said each sub-voxel with said preselected surface;

determining sub-voxel normal values in parallel only for those sub-voxels intersected by said preselected surface; and

displaying said normal values such that said values being displayed represent an image of said preselected surface.

21. A processing system of pipeline circuit architecture for rapidly displaying a two-dimensional image of a three-dimensional data array comprising:

a first circuit of pipeline configuration responsive to data values in said array, for simultaneously locating the position of a plurality of points on a surface of interest in said data array; and

a second circuit of pipeline configuration in parallel with said first circuit of pipeline configuration, also responsive to said data values, for simultaneously establishing intensity of the displayed image at said plurality of points.

4,985,835

METHOD AND APPARATUS FOR ACTIVATING A MOTOR VEHICLE SAFETY SYSTEM

Georg Sterler, Grossmehring, and Heinz Bader, Karlshuld, both of Fed. Rep. of Germany, assignors to Audi AG, Fed. Rep. of Germany

Filed Jan. 24, 1989, Ser. No. 300,894

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803426

Int. Cl.[5] B60R *21/08*

U.S. Cl. 364—424.05 **7 Claims**

1. A method for activating a motor vehicle safety system comprising:

measuring the deceleration of said vehicle and producing an acceleration signal indicating the magnitude of said vehicle deceleration;

calculating from said acceleration signal the projected position of a passenger of said vehicle due to said deceleration in accordance with the following formula:

$$S_f(t_x + z) = K1 \cdot S_f(t_x) + K2 \cdot v_{rel}(t_x) \cdot z + K3 \cdot a(t_x) \cdot \frac{z^2}{2} + K4 \cdot \frac{da(t_x)}{dt} \cdot \frac{z^3}{3}$$

where:

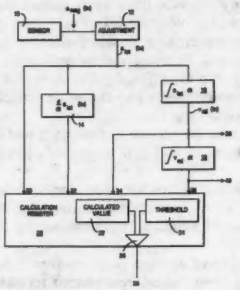
t_x=time x

z=activation time of the safety device

a (t)=acceleration sensor signal at time t

v_{rel}=relative velocity, calculated by integration of a (t)

S_f (t)=projected position of passengers at time t (calculated by doubled integration of the acceleration sensor signal.)



K_1–K_4=evaluation factors;

and

activating said safety system if said calculated projected position of said passenger exceeds a predetermined threshold value.

4,985,836

TRACTION CONTROL APPARATUS

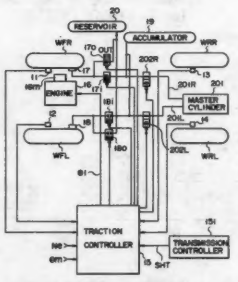
Masayuki Hashiguchi, Oobu; Kiichi Yamada, Nagoya; Masayoshi Ito, Okazaki; Atsuhiro Kawano, Oobu; Susumu Nishikawa, Okazaki; Takeshi Funakoshi, Oobu, and Shuji Ikeda, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1989, Ser. No. 339,702

Claims priority, application Japan, Apr. 20, 1988, 63-97274; Apr. 20, 1988, 63-97281; Sep. 5, 1988, 63-221603; Sep. 5, 1988, 63-221604; Sep. 5, 1988, 63-221608

Int. Cl.[5] B60K *31/00*

U.S. Cl. 364—426.02 **17 Claims**



1. A traction control apparatus comprising:

driving wheel velocity detecting means for detecting a driving wheel velocity of a vehicle;

driven wheel velocity detecting means for detecting a driven wheel velocity of the vehicle;

reference velocity setting means for setting a reference velocity on the basis of an output from said driven wheel velocity detecting means;

slip value detecting means for detecting a slip value of the driving wheel on the basis of a difference between an

output from said driving wheel velocity detecting means and an output from said reference velocity setting means;

lateral acceleration detecting means for detecting a lateral acceleration generated in a widthwise direction of the vehicle; and

target engine torque setting means for setting a target output torque of an engine of the vehicle in accordance with an output from said slip value detecting means, wherein said target engine torque setting means comprises travel acceleration detecting means for detecting a travel acceleration of the vehicle, reference drive torque setting means for setting a reference drive torque in accordance with an output from said travel acceleration detecting means, target output torque setting means for setting the target output torque of the engine in accordance with an output from said reference drive torque setting means, correction torque setting means for setting a correction torque in accordance with an output from said slip value detecting means, target output torque correcting means for correcting the target output torque in accordance with an output of said correction torque setting means, and correction torque changing means for changing the correction torque in accordance with an output from said lateral acceleration detecting means.

4,985,837

TRACTION CONTROL APPARATUS

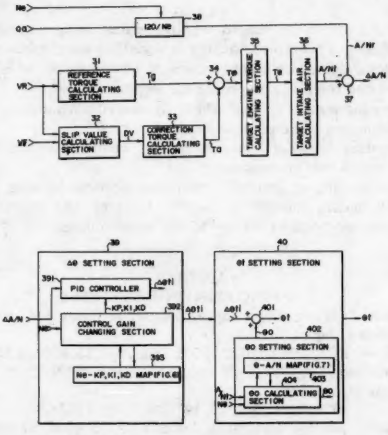
Kazuhide Togai, Takatsuki, and Makoto Shimada, Kyoto, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 383,794

Claims priority, application Japan, Jul. 27, 1988, 63-98375[U]; Jun. 28, 1989, 1-164108

Int. Cl.[5] B60K *31/00*

U.S. Cl. 364—426.02 **14 Claims**



1. A traction control apparatus comprising:

driving wheel speed detecting means for detecting a driving wheel rotational speed of a vehicle;

travel speed detecting means for detecting a travel speed of said vehicle;

slip detecting means for detecting a slip of driving wheels on the basis of a difference between an output from said driving wheel speed detecting means and an output from said travel speed detecting means;

target output torque setting means for setting a target engine output torque which reduces a drive torque in accordance with the slip detected by said slip detecting means;

target intake air amount setting means for setting a target intake air amount per a predetermined number of revolutions of said engine in accordance with the target engine output torque set by said target output torque setting means;

a throttle valve for adjusting an air amount taken into said engine;

intake air amount detecting means for detecting an intake air amount per the predetermined number of revolutions of said engine actually taken into said engine;

throttle opening correction value setting means for setting an opening correction value of said throttle valve on the basis of a difference between the target intake air amount set by said target intake air amount setting means and the actual intake air amount detected by said intake air amount detecting means;

target throttle opening setting means for setting a target opening of said throttle valve on the basis of the throttle opening correction value set by said throttle opening correction value setting means; and

throttle valve driving means for opening/closing said throttle valve in accordance with the target opening set by said target throttle opening setting means.

4,985,838

TRACTION CONTROL APPARATUS

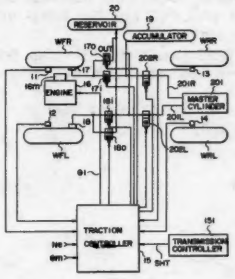
Masayuki Hashiguchi, Oobu; Kiichi Yamada, Nagoya; Masayoshi Ito, Okazaki; Atsuhiro Kawano, Oobu; Susumu Nishikawa, Okazaki; Takeshi Funakoshi, Oobu, and Shuji Ikeda, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1989, Ser. No. 339,703

Claims priority, application Japan, Apr. 20, 1988, 63-97274; Apr. 20, 1988, 63-97281; Sep. 5, 1988, 63-221603; Sep. 5, 1988, 63-221604; Sep. 5, 1988, 63-221608

Int. Cl.[5] B60K *31/00*

U.S. Cl. 364—426.02 **15 Claims**



1. A traction control apparatus comprising:

driving wheel velocity detecting means for detecting a driving wheel of the vehicle;

driven wheel velocity detecting means for detecting a driven wheel velocity of the vehicle;

reference velocity setting means for setting a reference velocity on the basis of an output from said driven wheel velocity detecting means;

slip value detecting means for detecting a slip value of the driving wheel on the basis of a difference between the driving wheel velocity and the reference velocity;

control start instruction means for outputting at least an engine control start signal when a slip state of the driving wheel including at least the slip value satisfies a predetermined control start condition;

vehicle acceleration calculating means for calculating a

vehicle acceleration of the vehicle on the basis of the output from said driven wheel velocity detecting means;

reference drive torque calculating means for calculating a reference drive torque on the basis of an output from said vehicle acceleration calculating means;

target output torque setting means for determining a target output torque of the engine in accordance with an output from said reference drive torque calculating means;

correction torque setting means for setting a correction torque on the basis of an output from said slip value detecting means, comprising proportional correction torque calculating means for calculating a proportional correction torque proportional to the slip value and integral correction torque calculating means for calculating an integral correction torque on the basis of an integral value of the slip value;

target output torque correcting means for correcting the target output torque in accordance with an output from said correction torque setting means;

drive torque control means for, when the engine control start signal is output, controlling an engine output of the vehicle in accordance with the corrected target output torque to control the drive torque of the driving wheel; and

shift change operation detecting means for detecting a shift change of a transmission of the vehicle, wherein when said shift change operation detecting means detects the shift change operation, said integral correction torque calculating means integrates the slip value to get an integral result while excluding a period of the shift change operation from an integral period of the slip value so as to calculate the integral correction torque in accordance with the integral result.

4,985,839

ANTILOCK BRAKING SYSTEM

Peter Dominke, Bietigheim-Metterz, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

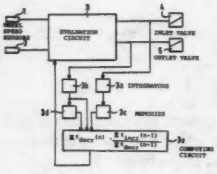
PCT No. PCT/EP87/00485, § 371 Date Mar. 30, 1989, § 102(e) Date Mar. 30, 1989, PCT Pub. No. WO88/02709, PCT Pub. Date Apr. 21, 1988

PCT Filed Aug. 26, 1987, Ser. No. 346,835

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1986, 3634241

Int. Cl.[5] B60T *8/32*

U.S. Cl. 364—426.02 **4 Claims**



1. An antilock braking system for a vehicle comprising:

(a) at least one sensor for monitoring the speed of a vehicle wheel and producing wheel speed signals;

(b) an electronic evaluation circuit which evaluates the wheel speed signals and generates control signals for a brake pressure control system which reduces and increases brake pressure in control cycles, said brake pressure being increased for a time duration at first with a large gradient relative to the gradient over the entire time duration and then with a relatively smaller gradient until a desired increase in pressure is reached; and

(c) a timing device which determines said time duration of brake pressure increase, said time duration being a function of the pressure reduction time in the current control cycle and of the ratio of the pressure buildup time to the pressure reduction time in the immediately preceding control cycle.

4,985,840

ARBITRARILY SHAPED WORKPIECE MACHINING METHOD

Satoru Shinozaki, Shimodate, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

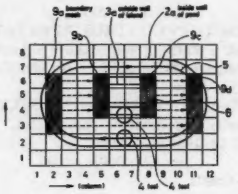
PCT No. PCT/JP88/00939, § 371 Date Apr. 27, 1989, § 102(e) Date Apr. 27, 1989, PCT Pub. No. WO89/03070, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 14, 1988, Ser. No. 350,741

Claims priority, application Japan, Sep. 22, 1987, 62-238127

Int. Cl.[5] G05B *19/403*

U.S. Cl. 364—474.29 **3 Claims**



1. An arbitrarily shaped workpiece machining method of machining a workpiece having arbitrarily shaped machining portions defined by closed curves of a pond shape, an island shape and the like, comprising the steps of:

forming meshes on said arbitrarily shaped portions;

machining contours of said closed curves;

creating boundary meshes having center lines through which said contours pass; and

horizontally or vertically machining portions between said boundary meshes to thereby machine said arbitrarily shaped portions defined by the closed curves.

4,985,841

TAPPING CONTROL SYSTEM

Takashi Iwagaya, Hino, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP87/00182, § 371 Date Nov. 23, 1987, § 102(e) Date Nov. 23, 1987, PCT Pub. No. WO87/05839, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 25, 1987, Ser. No. 138,842

Claims priority, application Japan, Mar. 25, 1986, 61-64847; Mar. 25, 1986, 61-64848

Int. Cl.[5] G06F *15/46, 7/64;* B23G *1/16*

U.S. Cl. 364—474.33 **15 Claims**

1. A tapping control system for a machine capable of tapping a screw with a tap or cutting with a cutting tool and using, as a principal-axis motor, a digital spindle motor controlled by means of a digital control circuit, and a servo-motor for tool feed and being controlled by a servo-circuit, the system comprising,

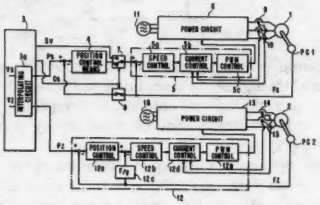
an interpolating circuit for distributing pulses individually to said digital control circuit and the servo-circuit to effect linear interpolation in accordance with the pitch value of the screw to be worked.

a pulse coder responsive to rotation of the digital spindle

motor for outputting a feedback signal indicative of a rotational speed of the spindle motor.

position control means for delivering a speed command to said digital control circuit in accordance with the distributed pulses from the interpolating circuit and the feedback signal outputted from the pulse coder to effect feedback control of the rotational position of said spindle motor distributing pulses individually to said digital control circuit and a servo-circuit for a servomotor for axially moving a tool, wherein said spindle motor and said servomotor are driven in synchronism with each other, said spindle motor and said servomotor being forwardly rotatable in a tapping mode for a predetermined amount of tapping work, and said spindle motor and said servomotor being reversely rotatable to retract the tap through a distance less than said predetermined amount of forward rotation, said forward and reverse rotatable motion being repeated alternatingly in a fixed cycle.

5. A tapping control system for a machine capable of tapping a screw with a tap or cutting with a cutting tool using, as a principal-axis motor, a digital spindle motor controlled by means of a digital control circuit, the system comprising,



an interpolating circuit for distributing pulses individually to said digital control circuit and the servocircuit to effect linear interpolation in accordance with the pitch value of the screw to be worked,

a pulse coder responsive to rotation of the digital spindle motor for outputting a feedback signal indicative of a rotational speed of the spindle motor,

position control means for delivering a speed command to said digital control circuit in accordance with the distributed pulse from the interpolating circuit and the feedback signal outputted from the pulse coder to effect feedback control of the rotational position of said spindle motor; and

switching means for switching the system from an open control position over to a feedback control position; said switching means switching to the feedback control position during tapping, said interpolating circuit distributing pulses individually to said digital control circuit and said servo-circuit for linear interpolation in accordance with the pitch value a screw to be worked, wherein said spindle motor and said servomotor are driven in synchronism with each other.

4,985,842

DYNAMICALLY VARIABLE DISPLAY AND PRINTER SUBSYSTEM FOR USE IN SORTING OPERATIONS

Robert L. Ward, 1129 E. Vaughn, Tempe, Ariz. 85283

Continuation-in-part of Ser. No. 124,052, Nov. 13, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 326,028

Int. Cl.[5] G06F *15/20*

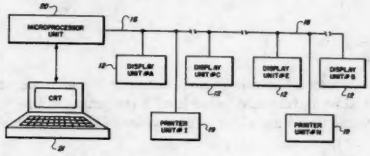
U.S. Cl. 364—478 **14 Claims**

1. A display and printer subsystem for use with a multi-station sorting system, each station having sort criteria assigned thereto, said each station receiving sorted material determined by said assigned sort criteria, said subsystem comprising:

a microprocessor unit, said microprocessor unit having sort files stored therein, wherein each sort file is derived from a sort criteria;

a plurality of display devices, each display device located in a predetermined physical relationship with one of said stations, said physical relationship causing said each display device to be identified with said one station, said microprocessor transferring data signals to said each display device from a sort file derived from a sort criteria assigned to said identified station;

a plurality of printers, each of said printers assigned to a preselected set of said display devices; and



a plurality of switch means, each of said switch means located in a preselected physical relationship with a one of said stations, said preselected physical relationship identifying said each switch means with said one station, wherein activation of a selected switch means causes a printer assigned to a station identified with said selected switch means to print data from a sort file derived from a sort criteria assigned to said station identified with said selected switch means.

4,985,843

DIGITAL LOCATOR

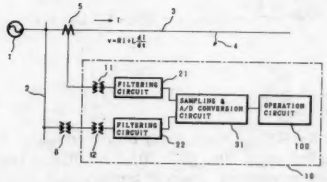
Genzaburou Kotani, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 152,865, Feb. 5, 1988, abandoned. This application Dec. 26, 1989, Ser. No. 453,197

Claims priority, application Japan, Mar. 3, 1987, 62-49421; Mar. 3, 1987, 62-49422

Int. Cl.[5] G01R *19/00;* **G06F** *15/56*

U.S. Cl. 364—483 **2 Claims**



1. A digital locator comprising:

voltage transforming means for transforming a voltage of a power system having a value "v" to a transformed voltage;

current transforming means for transforming a current of said power system having a value "i" to a transformed current;

a first filtering means connected to said voltage transforming means for eliminating restricted frequency bands in said transformed voltage;

a second filtering means connected to said current transforming means for eliminating restricted frequency bands in said transformed current;

means connected to said first and second filtering means for sampling the filtered transformed voltage and said filtered transformed current of said power system at an odd number of equal timewise intervals and converting the filtered transformed voltage to a digital voltage value representa-

tive of said value v and converting the filtered transformed current to a digital current value representative of said value i;

a first operation means for calculating the integration formula

$$\int_{t_{n-1}}^{t_{n+1}} v dt = R \int_{t_{n-1}}^{t_{n+1}} i dt + L(i)_{in-1}^{tn+1}$$

of the equation

$$v = Ri + L\frac{di}{dt}$$

expressing the relationship between a resistance value R and an inductance value L of a transmission line and the value v and the value i, for a series of sampling times t_0, t_1 . . . t_{n-1}, t_n, . . . t_{n+1} . . . t_{2n};

a second operation means for calculating the integration formula

$$\int_{t_n}^{t_{n+2}} v dt = R \int_{t_n}^{t_{n+2}} i dt + L(i)_{in}^{tn+2}$$

of the equation

$$v = Ri + L\frac{di}{dt};$$

a third operation means for approximating the integration formula

$$\int_{t_{n-1}}^{t_{n+1}} f(t)dt$$

of said first and second operation means by the following approximating integration formula

$$\int_{t_{n-1}}^{t_{n+1}} f(t)dt = \frac{K_1\theta}{2}\{f_{(tn-1)} + 2f_{(tn)} + f_{(tn+1)}\} + \sum_{l=1}^{(N_0-1)} K_{l+1}l\theta\{f_{(tn+l)} + f_{(tn-l)}\}$$

where K_1, K_2, . . . respectively denote constants, θ denotes sampling angle, $f(t_{n-l})$, . . . $f(t_n)$, . . . $f(t_{n+l})$ respectively denote momentary values of times t_{n-l}, . . . t_n, . . . t_{n+l}, and N_0 denotes an odd number of sampling values,

whereby said resistance value R and inductance value L of a transmission line up to a position where a fault point is present are obtained from said first, second and third operation means.

4,985,844

STATISTICAL WAVEFORM PROFILER EMPLOYING COUNTER/TIMER

Clark P. Foley, Portland, Oreg., and Donald L. Taylor, Vancouver, Wash., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 8, 1989, Ser. No. 348,434

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—487 **13 Claims**

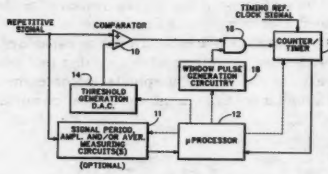
1. A method of obtaining a statistical waveform profile of the time during which a repetitive electronic signal is within each of a plurality of amplitude bins distributed over an amplitude range of the signal, each amplitude bin being bounded by an adjacent pair of threshold amplitudes, comprising the steps of;

generating a window pulse having a predetermined duration;

determining for the predetermined duration a time duration during which the amplitude of the repetitive electronic signal bears a predetermined relationship to each threshold amplitude for all the amplitude bins; and

subtracting the time duration for each adjacent pair of threshold amplitudes to produce a plurality of time differences, one for each amplitude bin, the time differences representing times for the statistical waveform profile.

8. An apparatus for obtaining a statistical waveform profile of the time during which a repetitive electronic signal is within



each of a plurality of amplitude bins distributed over an amplitude range of the signal, each amplitude bin being bounded by an adjacent pair of threshold amplitudes, comprising:

means for generating a window pulse having a predetermined duration;

means for determining during the duration of the window pulse a time duration during which the amplitude of the repetitive electronic signal bears a predetermined relationship to each threshold amplitude for all the amplitude bins; and

means for subtracting the time durations for each adjacent pair of threshold amplitudes to produce a plurality of time differences, one for each amplitude bin, the time differences representing times for the statistical waveform profile.

4,985,845

MODULAR ELECTRICAL CONTROL DISTRIBUTION SYSTEM

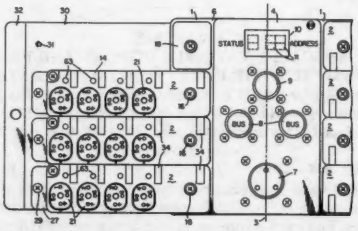
Eckart Götz; Hans-Reter Lerch, both of Erbach; Thomas Dörsam, Birkenau; Gerhard Schweigert, Darmstadt; Werner Wittmann, Erbach, and Michael Korner, Reinheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 5, 1989, Ser. No. 293,637

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1988, 3800077

Int. Cl.[5] G06F *13/00*; G08C *25/00*; H05K *5/00*

U.S. Cl. 364—492 **34 Claims**



1. Decentralized modular input/output unit adapted to be

located in the immediate vicinity of a machine or controlled device and

additionally adapted for electrical connection to an electronic control unit (8'), especially a programmable memory control for the machine or controlled device, via a connecting bus (8")

in combination with

at least one electronic input/output module (2),

wherein said at least input/output module includes an input-/output stage (77) and a connection plug means (71, 72 73), and

wherein said modular input/out unit comprises

a distribution box (1);

at least one bus socket (8) in said box adapted for electrical and mechanical connection of said connecting bus (8"), with said box (1),

a plurality of further sockets (12) in said box for receiving the connection plug means (71, 72, 73) of at least of one of said input/output modules;

an electronic logic component (56) shielded with respect to external environmental influences and electrically connected to said at least one bus socket (8) and to said plurality of further sockets (12), located within said box, said logic component (56) controlling the distribution, exchange and interchange of signals between said control unit (8') and said at least one input/output module (2); and

means (5, 17, 28, 52) for sealing the distribution box (1), said bus socket (8) and said plurality of further sockets (12) against contamination, or ingress of at least one of: dust, moisture, water.

4,985,846

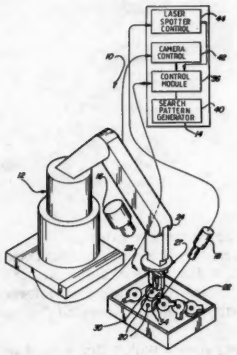
ACOUSTICAL/OPTICAL BIN PICKING SYSTEM

Patrick J. Fallon, 17255 Ridge Rd., Northville, Mich. 48167

Filed May 11, 1989, Ser. No. 350,164

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—513 **5 Claims**



1. A system for gripping with a robot manipulator a randomly oriented shaped object having a predetermined feature, said manipulator gripping said object in a predetermined orientation, said system comprising:

memory means for storing an image of said object, said stored image of said object showing said predetermined feature on said object in said predetermined orientation;

acoustic transducer means mounted on said manipulator for emitting and receiving acoustic signals and converting said acoustic signals received to electrical signals;

first control means for sluing said manipulator over a predetermined area within which said object is located and for evaluating said received electrical signals to locate said object and generate a bearing signal representative of the bearing and distance to said object;

video means for capturing a current image of said object at said bearing and comparing said image with said stored image of said object to identify and locate said feature on said object;

means for calculating a drive bearing to the centroid of said object from the location of said feature and said bearing signal and moving said manipulator along said drive bearing to a predetermined distance from said object;

acoustic transducer array means mounted on said manipulator emitting and receiving acoustic signals and converting said received signals to electrical signals proportional to the aspect of said object when said manipulator is positioned said predetermined distance from said object along said drive bearing;

second control means for interpreting said electrical signals from said array means and comparing said signals to said stored image to produce an error drive signal to said manipulator, said error drive signal being proportional to the error between said aspect of said object and the position of said manipulator, said drive signal moving said manipulator along said drive bearing to null said error drive signal thus orienting said manipulator to grip said object in said predetermined orientation when said error drive signal is nulled.

4,985,847

VISUAL SENSOR SYSTEM

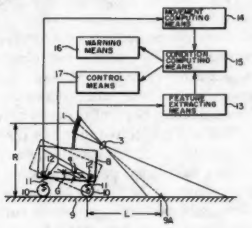
Makoto Shioya, Tokyo, and Masao Adachi, Sagamihara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 13, 1988, Ser. No. 143,482

Claims priority, application Japan, Jan. 14, 1987, 62-4819

Int. Cl.[5] G06F *15/20*; G01N *21/84*

U.S. Cl. 364—516 **6 Claims**



1. An image sensor system for a vehicle, comprising:

a one-dimensional array of photosensitive means mounted on said vehicle, said array of photosensitive means being arranged within an image plane and said array forming, within said image plane, a predetermined angle with respect to a line forming the intersection between said vehicle's plane of motion and said image plane, such that edge features of images projected onto said image plane which are parallel to said intersection line and which are spaced apart in a direction perpendicular to said intersection line will have their respective points of intersection with said array spaced apart in the direction of said array angle, and image edge features projected onto said image plane which are perpendicular to said intersection line and which are spaced apart in a direction parallel with said intersection line will have their respective points of intersection with said array spaced apart in the direction of said array angle; and

a processing means which, based on outputs from said photosensitive means, detects image edges within said image plane which are parallel or perpendicular to said intersection line.

4,985,848

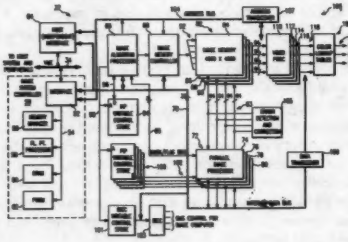
HIGH SPEED IMAGE PROCESSING SYSTEM USING SEPARATE DATA PROCESSOR AND ADDRESS GENERATOR

David M. Pfeiffer, Plano; David T. Stoner, McKinney; John P. Norsworthy, Carrollton; Dwight D. Dipert, Richardson; Jay A. Thompson; James A. Fontaine, both of Plano, and Michael K. Corry, Dallas, all of Tex., assignors to Visual Information Technologies, Inc., Plano, Tex.

Filed Sep. 14, 1987, Ser. No. 97,664

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—518 **43 Claims**



1. An image processing system, comprising:

a plurality of memory planes for storing pixel data comprising digital representations of an image, each said memory plane having a plurality of addressable locations, each said addressable location for storing N pixels of image data;

a random access address generator for programmably generating memory addresses for accessing said memory planes to read and write pixel data stored therein;

a plurality of data processors each associated with a respective memory plane for programmably processing pixel data accessed by said address generator;

a program memory connected to said address generator and said data processors for storing instruction words, said instruction words operable to control the operation of said address generator and said data processors;

a bus for communicating N parallel pixels between the data processors and said respective memory planes; and

a video processor for processing pixel data output by said memory planes, said video processor being connected to said memory planes by an output bus for communication of N parallel pixels, said video processor further including a parallel-to-serial pixel converter for converting said parallel pixels to serial pixels for output from said image processing system.

4,985,849

IMAGE PROCESSING SYSTEM FOR FORMING A SLANTWISE-MAPPED OR ROTATED MODIFIED IMAGE OF AN ORIGINAL IMAGE

Kawamura Hideaki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,598

Claims priority, application Japan, Jun. 12, 1987, 62-146733; Nov. 10, 1987, 62-282261

Int. Cl.[5] G06F *15/62*

U.S. Cl. 364—518 **13 Claims**

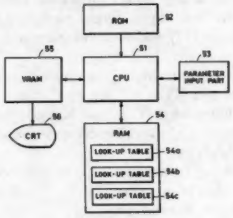
1. An image processing apparatus for forming a modified image from an original image in a rectangular area, wherein the modified image is formed by means of slantwise-mapping the original image into a parallelogram area, comprising:

a first memory for storing data representing a plurality of points on two adjacent edges in the parallelogram area;

a second memory for storing data based on a ratio of lengths of two adjacent edges in the rectangular area to lengths of two adjacent edges in the parallelogram area associated with the two adjacent edges in the rectangular area;

a first calculator for calculating modified addresses of pixels within the parallelogram area in accordance with data read out from said first memory;

a second calculator for calculating original addresses of pixels within the rectangular area corresponding to the



modified addresses calculated by said first calculator in accordance with data read out from said second memory; and

transfer means for transferring image data stored in memory from the original addresses in memory calculated by said second calculator to the corresponding modified addresses in memory calculated by said first calculator.

4,985,850

OUTPUT APPARATUS

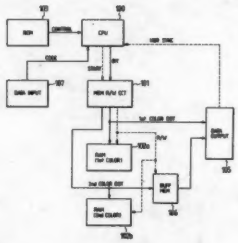
Yoshifumi Okamoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,395

Claims priority, application Japan, Mar. 15, 1988, 63-59511

Int. Cl.[5] G06K *15/00*

U.S. Cl. 364—519 **4 Claims**



1. An output apparatus comprising:

conversion means for converting input code data into data representing a dot image of a plurality of colors;

first memory means for storing print information of a first color among the data converted by said conversion means;

second memory means which stores print information of a second color among the data converted by said conversion means and has the same address arrangement as that of said first memory means;

reading means for simultaneously reading out the print information of the first and second colors from said first and second memory means synchronously with a print timing for the print information of the first color; and

timing adjusting means for delaying a print timing for the readout print information of the second color with respect to that print timing for the print information of the first color by a predetermined time.

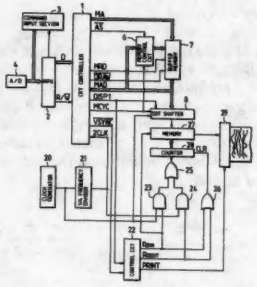
4,985,851

Patent Not Issued For This Number

4,985,852
METHOD OF AND APPARATUS FOR DRIVING A DOT ARRAY RECORDER

Kohei Ono; Hitoshi Satoh, and Masako Kutsuma, all of Tokyo, Japan, assignors to Nihon Kohden Corporation, Tokyo, Japan

Filed Mar. 9, 1989, Ser. No. 321,122
Claims priority, application Japan, Mar. 9, 1988, 63-53810
Int. Cl.[5] G06K *15/00*
U.S. Cl. 364—519 **20 Claims**



1. A method of driving a recording device in synchronism with a CRT driving system having a CRT sync signal, said method comprising the steps of:

(a) storing image processed data in a first memory for CRT driving system;

(b) supplying a data input signal in response to a data display timing signal received a predetermined time after said CRT sync signal;

(c) storing part of said stored image processed data in a second memory in response to said data input signal;

(d) supplying a data output signal after said image processed data has been stored in said second memory;

(e) supplying, in response to said data output signal, the image processed data stored in said second memory to a recording head at a speed corresponding to a response speed of said recording head, and

(f) printing said image processed data supplied to said recording head.

4,985,853
DISPLAY-BASED COLOR SYSTEM

Joann M. Taylor, Beaverton; Paul A. McManus, Sherwood; Gerald M. Murch, Portland; Roxanna F. Rochat, and Novia A. Weiman, both of Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 113,029, Oct. 26, 1987. This application Mar. 20, 1989, Ser. No. 325,428
Int. Cl.[5] G06F *15/626*
U.S. Cl. 364—521 **24 Claims**

1. A method for defining a perceptually uniform color space, said color space having coordinates H, V and C which are based upon CIELUV coordinates L*, v* and u*, the method comprising the steps of:

(a) determining a maximum CIELUV chroma $C^*_{uv}=-(u^{2*}+v^{*2})^{\frac{1}{2}}$ producible by a display device that has a plurality of color-producing primaries, the intensity of the primaries being adjustable to produce a gamut of colors;

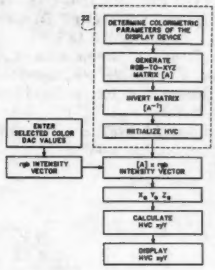
(b) establishing a chroma factor C_f based upon the determined maximum CIELUV chroma; and

(c) defining the color space coordinates as:

$$H=\arctan(v^*/u^*)+K-H_0,$$

wherein K and H_0 are constants, the value of K being a function of the arithmetic sign of v* and u*, and the value of H_0 selected to establish the coordinate value H=0 relative to the u* axis

$$V=L^*$$

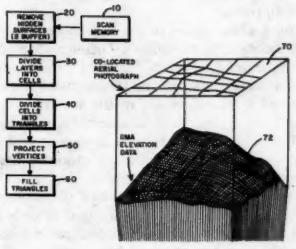


$$C=C^*_{uv}(V)/13$$

4,985,854
METHOD FOR RAPID GENERATION OF PHOTO-REALISTIC IMAGERY

Timothy M. Wittenburg, North Chelmsford, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 15, 1989, Ser. No. 351,466
Int. Cl.[5] G06F *15/72*; G09B *9/30, 9/34*
U.S. Cl. 364—522 **4 Claims**



1. A method for providing rapid generation of photorealistic imagery for use in a digital display system including a memory which contains first and second ortho-rectified data layers wherein the first data layer comprises a digitized photograph of known resolution and spacing values and the second layer comprises digitized elevation data corresponding to the photograph in the first data layer, the method comprising the steps of:

(a) scanning corresponding portions of the first and second data layers out of memory;

(b) dividing the scanned portions into plurality of 2 pixel by 2 pixel cells so as to form the cells using adjacent pixels for the first data layer wherein each cell is comprised of four vertices and wherein each of the four vertices is described by information stored in the memory including:

(i) an X, Y coordinate, and

(ii) a Z coordinate representative of its elevation which is known from the elevation layer so as to allow the vertices to lie in different planes;

(c) further dividing the cells into triangular sections having vertices;

(d) removing hidden surfaces from the scanned portion

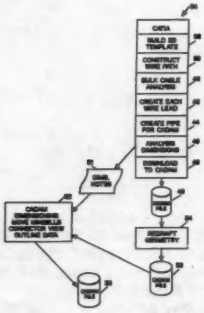
(e) projecting the vertices into the viewscreen under the coordinates in the second layer and the known values and
(f) shading the area subtended by the projected vertices.

4,985,855

METHOD FOR PRODUCING INSTALLATION INSTRUCTIONS FOR THREE DIMENSIONAL ASSEMBLIES

Gary R. Aldrich; George T. Brown, both of Apalachin, N.Y.; David B. Millis, Friendsville, Pa., and Ronald P. Nowak, Endicott, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 24, 1987, Ser. No. 88,916
Int. Cl.[5] G06F *3/14*
U.S. Cl. 364—522 **53 Claims**



20. A method of producing instructions for installing first and second cable assemblies in a larger, mechanical assembly, the steps comprising:

(a) designing a first model of the first cable assembly and the larger, mechanical assembly by using a three dimensional mechanical design system, said first cable assembly being housed at least in part in said larger, mechanical assembly;
(b) designing a second model of the second cable assembly and said larger, mechanical assembly, said second cable assembly being housed at least in part in said larger, mechanical assembly, said second model being designed without said first cable assembly, and said first model being designed without said second cable assembly;
(c) combining said first and said second models into a third model of said first and said second cable assemblies and said larger, mechanical assembly; and
(d) selecting a three dimensional view of said third model and transferring said three dimensional view to a two dimensional representation while retaining the aspect ratios of the cable assemblies and of said larger, mechanical assembly.

4,985,856

METHOD AND APPARATUS FOR STORING, ACCESSING, AND PROCESSING VOXEL-BASED DATA

Arie E. Kaufman, and Reuven Bakalash, both of Plainview, N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

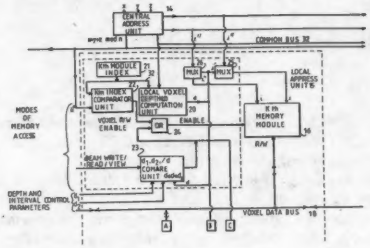
Filed Nov. 10, 1988, Ser. No. 269,567
Int. Cl.[5] G06F *15/72*
U.S. Cl. 364—522 **19 Claims**

1. A method of storing and retrieving one or more voxels of a beam disposed along one or more of a plurality of storage/retrieval directions of a 3 -D matrix array in 3-D discrete voxel space, said 3 - D discrete voxel space being specified in terms of x, y and z coordinate directions, said method comprising the steps of:

(a) storing said voxels into memory storage space, by mapping said voxels along one of said plurality of storage/retrieval directions, into a plurality of n independently accessible memory modules in said memory storage space, each said memory module being indexed with memory module indices k=0, 1 . . . n−1 and each said k-th memory module having n^2 internal memory cell addresses, said n being an integer and each said memory cell provided with internal module indices, i and j, said mapping being carried out in accordance with a linear skewing function of the general form

$$k=(ax+by+cz) \bmod n$$

where x, y and z are the coordinate values of each said voxel in said 3 -D discrete voxel space, where i=x and j=y, and where a, b and c are integer coefficients and n is a prime relative to said integer coefficients a, b and c, and linear combinations of said integer coefficients a, b and c the number of storage/retrieval directions in said n^3 matrix array in said 3- D discrete voxel space being based upon the values of said integers a, b, c and n; and



(b) retrieving said voxels along one of said plurality of storage/retrieval directions in said 3-D voxel space, by demapping said one or more voxels along said beam by
(i) determining each voxel depth measure representative of the depth of each said voxel in said n^3 matrix array in aid 3- D discrete voxel space, said determination of said voxel depth measure being determined based on one or more of said x, y and z coordinate values of said voxel, said integer coefficients a, b and c, and said module index k of said memory module into which said voxel has been mapped in step (a).
(ii) for each voxel along said beam parallel to said storage/retrieval direction, determining said memory cell indices i and j on the basis of said voxel depth measure and said x, y and z coordinate values corresponding to each said voxel, and
(iii) identifying each voxel along a specified storage/retrieval direction using said memory cell indices i and j resulting from step b (ii) and said module index k resulting from step a.

4,985,857

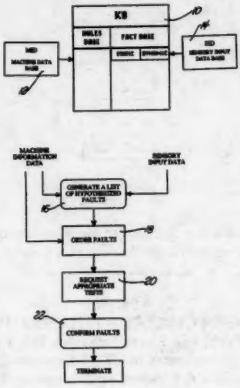
METHOD AND APPARATUS FOR DIAGNOSING MACHINES

Atul Bajpai, Warren; Richard W. Marczewski, Rochester; Melissa M. Marek, Royal Oak; Anil B. Shrivastava, Troy; Charles S. Amble, Prudenville, all of Mich.; Robert H. Joyce, San Jose, Calif.; Nanda Kishore, Los Gatos, Calif., and Steven J. Ollanik, Los Altos, Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 19, 1988, Ser. No. 234,371
Int. Cl.[5] G01F *15/15*
U.S. Cl. 364—551.01 **18 Claims**

1. A general purpose expert system architecture for diagnosing component faults in any one of a plurality of machines, comprising a machine information database containing infor-

mation on physical characteristics of various components of at least one of said plurality of machines, a sensory input database containing sensory data taken at predetermined locations on at least one of said plurality of machines, a knowledge base containing a plurality of general rules that are applicable to all



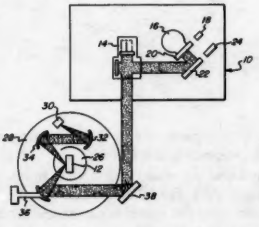
components of interest in the plurality of machines without reference to any specific machine, and an inference engine which manipulates the rules to enable the system to identify faults based on data from said sensory database and information from said machine information database.

4,985,858

METHOD AND APPARATUS FOR TEMPERATURE DETERMINATION

Philip W. Morrison, Jr., South Windsor; Peter R. Solomon, West Hartford, and David G. Hamblen, East Hampton, all of Conn., assignors to Advanced Fuel Research, Inc., East Hartford, Conn.

Filed May 23, 1989, Ser. No. 356,078
Int. Cl.[5] G01J *5/08*; G01N *21/62*
U.S. Cl. 364—557 **26 Claims**



17. Apparatus adapted for use in optically determining the surface temperature of a sample, comprising:

a. means for causing spectral electromagnetic radiation to impinge upon a sample so as to produce reflection of electromagnetic radiation from the surface thereof;

b. means for detecting electromagnetic radiation reflected from the surface of such a sample, and for identifying any wavenumber value "v" of the incident radiation at which there is substantially zero reflectance from the surface;

c. means for measuring spectral radiance from the surface, including radiance at wavenumber value v; and

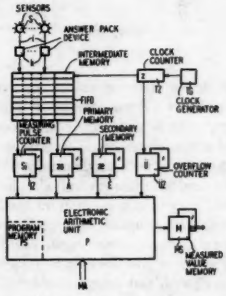
d. means for correlating the measured radiance to the radiance of a theoretical black body at wavenumber value v to determine the temperature "T".

4,985,859

METHOD FOR IDENTIFYING AND INTERROGATING THE MEASURED VALUE OF THE VELOCITY OR SPEED OF AN OBJECT

Hans Rauner, Nittenau; Erwin Grauvogl, Sinzing; Gerhard Gerl, Regensburg, and Josef Forster, Woerth/Donau, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 9, 1989, Ser. No. 433,954
Claims priority, application European Pat. Off., Nov. 11, 1988, 88118880.9
Int. Cl.[5] G01P *3/48*; G01R *23/02*
U.S. Cl. 364—565 **11 Claims**



7. An apparatus for identifying and interrogating a measured value M of velocity or speed of an object, comprising:

sensor means for generating a respective measuring pulse when the object moves through a path interval of a fixed size;

clock generator means for generating clock pulses having a constant clock frequency;

a clock counter means connected to the clock generator means;

means for calculating a sum of the measuring pulses as a measuring pulse sum Si in a measuring interval that is limited by a first and by a last measuring pulse;

means for calculating a sum of the clock pulses as a clock pulse sum St during said measuring interval;

means for calculating a new value of measured value M for each measuring interval from said measuring pulse sum Si and said clock pulse sum St;

means for providing initialization instructions;

means for reading a counter reading z of said clock counter means and allocating it to a respective triggering event upon arrival of every measuring pulse and at every initialization instruction;

means for storing a counter reading z allocated to the initialization instruction and to a first, following measuring pulse as an initial value za, said initial value za being an initial value of a measuring interval and of an interrogation interval that begins therewith;

means for storing the counter reading z allocated to every following measuring pulse as a final value ze, whereby every new counter reading overrides a preceding counter reading; and

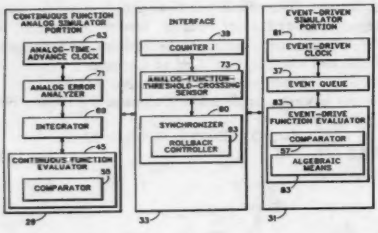
means for a measured value call-in means ending the measured interval with a last measuring pulse, using a difference between the final value ze and the initial value za as said clock pulse St, and for storing the final value ze as a new initial value za if the measuring pulse sum Si is greater than 1 and less than a maximum value Simax.

4,985,860

MIXED-MODE-SIMULATOR INTERFACE

Martin Vlach, 6112 SW. Jan Tree Ct., Portland, Oreg. 97219

Filed Jun. 21, 1989, Ser. No. 369,358
Int. Cl.[5] G06J 1/00
U.S. Cl. 364—578 10 Claims



1. A mixed-mode-simulator interface for synchronizing, at non-regular intervals, a system simulator which includes an analog simulator, which analyzes continuous-function elements and events at non-equal, error-determined intervals in an analog realm, and which has a predetermined threshold-crossing value therein, and an event-driven simulator, which analyzes elements and events at non-equal, event-driven intervals in an event-driven realm, wherein both simulators are performing a simulation on a single, mixed-mode system, comprising:

analog-time-advance means for advancing analog simulation time by a predetermined time amount;

integration means for predicting analog values;

analog-error-analysis means for determining an acceptable analog error and for selecting said predetermined time amount;

an analog-function-threshold-crossing sensor for detecting, from the threshold-crossing value, a threshold crossing of a continuous function, and a crossing time therefore;

an event queue for receiving said crossing time and event times and values from the event-driven simulator, and for determining a next-event time;

evaluation means for evaluating only those event-driven elements whose value has changed since the last event; and

synchronizer means for determining continuous function values at a future time which is prior to the end of said predetermined time amount.

4,985,861

HIGH SPEED DIGITAL SIGNAL PROCESSOR FOR SIGNED DIGIT NUMBERS

Masakazu Yamashina; Hachiro Yamada, and Tadayoshi Enomoto, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

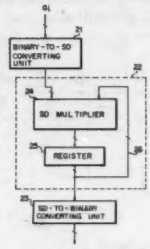
Filed Jan. 27, 1989, Ser. No. 302,346
Claims priority, application Japan, Jan. 29, 1988, 63-20592
Int. Cl.[5] G06F 7/00, 15/00
U.S. Cl. 364—746.2 11 Claims

1. A high-speed digital signal processor comprising:

(a) a Signed Digit (SD) arithmetic unit having at least first and second input ports and operative to execute an arithmetic operation on signed digit numbers each consisting of a plurality of digits for producing a calculating result represented by a signed digit number;

(b) a signed digit number feeder supplied with a binary number and operative to supply said first input port with a signed digit number;

(c) a register operative to store said calculating result in a rewritable manner and having an output port coupled to said second input port; and



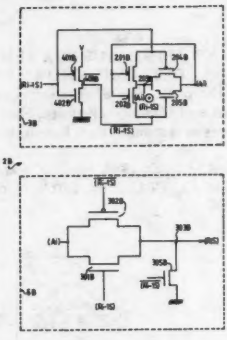
(d) a binary number discharger supplied with the calculating result and operative to discharge a binary number.

4,985,862

BINARY ADDER CIRCUIT WITH IMPROVED INPUTS

Hedi Hmida, Paris, and Pierre Duhamel, Issy Les Moulineaux, both of France, assignors to ETAT Francais represente par le Ministre Delegue des Postes et Telecommunications (Centre National d'Etudes des Telecommunications), Issy Les Moulineaux, France

Filed Sep. 23, 1988, Ser. No. 248,089
Claims priority, application France, Sep. 23, 1987, 87 13146
Int. Cl.[5] G06F 7/50
U.S. Cl. 364—786 6 Claims



1. A binary complementary metal oxide semiconductor (CMOS) calculation cell, comprising:

a 1-bit first input for receiving a first input signal (Ai) of arbitrary binary value taken from a variable operand (A),

a 1-bit second input for receiving a second bit corresponding to a bit of logic value "1" and taken from a fixed operand (B),

a 1-bit carry-in input for receiving a carry-in input signal (Ri-1 S),

a logic inverter means connected to said carry-in input signal, for delivering the complement of said carry-in input signal,

a fist logic module for generating a first output bit, said first output bit being an exclusive-OR signal (Ai⊕Ri-1 S), representing the symmetrical exclusive-OR function of said first input signal and said carry-in input signal,

a second logic module for generating a carry-out output bit, said carry-out output bit being a logic symmetrical trigger function representing said first input signal depending

upon the said carry-in input signal and complemented carry-in input signal, said second logic module further comprising:

(i) a first pair of opposite polarity transistors forming a symmetrical source-to-drain arrangement and a symmetrical drain-to-source arrangement, with agate of a first transistor of the pair being connected to said carry-in input signal and a gate of a second transistor of the pair being connected to said complemented carry-in signal, said source-to-drain arrangement being connected to the first input bit, and said drain-to-source arrangement delivering said carry-out output bit, and

(ii) a single transistor which is an N-channel transistor with its source connected to ground, with its gate controlled by said complemented carry-in input signal, and with its drain delivering said carry-out output bit,

a 1-bit first output for receiving said first output bit; and

a 1-bit second output for receiving said carry-out output bit.

4,985,863

DOCUMENT STORAGE AND RETRIEVAL SYSTEM

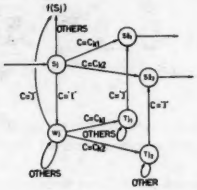
Hiromichi Fujisawa, Tokorozawa; Atsushi Hatakeyama, Kokubunji; Yasuaki Nakano, Hino; Junichi Higashino, Koganei, and Toshihiro Hananoi, Naka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 894,855, Aug. 8, 1986, abandoned. This application Jul. 30, 1990, Ser. No. 559,994

Claims priority, application Japan, Aug. 23, 1985, 60-184181

Int. Cl.[5] G06F *15/40*

U.S. Cl. 364—900 **9 Claims**



1. A document storage and retrieval system comprising:

storage means for storing plural documents of data to be retrieved, said data being stored in the form of character strings, said character strings including multiple candidates of character codes for a character which is not identified during character recognition of characters indicated in said plural documents, said multiple candidates of character codes being located between predetermined special character codes;

input means for inputting a partial character string retrieval request to initiate a text search for retrieval of a desired document having a desired partial character string out of said plural documents;

first generation means connected to said input means for generating a hetero-notation and a synonym in response to said partial character string retrieval request by using a hetero-notation convention and a thesaurus and for generating an aggregation of character strings on the basis of said hetero-notation and synonym generation;

second generation means connected to said first generation means for generating a finite state automaton in the form of a state transition matrix based on said aggregation of character strings generated by said first generation means in accordance with a predetermined rule, and for generating an extended finite state automaton defining predetermined states to transform a character string aggregation when said predetermined special character codes, which indicate the location of multiple candidates of character codes in said character strings, appear during retrieval of said plural documents;

means responsive to said second generation means for reading characters one-by-one out of said storage means and for verifying whether or not a desired partial character string exists according to said finite state automaton or said extended finite state automaton; and

means responsive to said reading and verifying means for outputting the documents in which said partial character string exists.

4,985,864

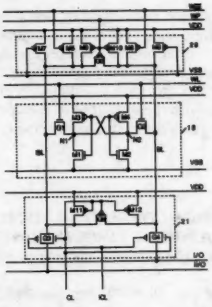
STATIC RANDOM ACCESS MEMORY HAVING COLUMN DECODED BIT LINE BIAS

Jack A. Price, Aloha, Oreg., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Jun. 23, 1989, Ser. No. 370,542

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—189.06 **10 Claims**



1. A random access memory for receiving and storing a data bit during a write cycle and for reading out a stored data bit during a read cycle, the memory comprising:

a plurality of bit line means;

a plurality of memory cells connected to separate bit line means and including means for alternatively storing a data bit of a state determined by a bias on selected bit line means and for biasing said selected bit line means in accordance with a state of a data bit stored in a memory cell; and

input/output means, responsive to an input column address signal identifying one of said memory cells, for clamping bit line means connected to memory cells other than the identified one memory cell to a voltage source during a write cycle, for biasing bit line means connected to the identified memory cell in accordance with a state of an input data bit during said write cycle, and for generating an output data bit in accordance with a bias of selected bit line means connected to the identified memory cell during a read cycle.

4,985,865

ASYMMETRICAL DELAY FOR CONTROLLING WORD LINE SELECTION

Theodore W. Houston, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 21, 1988, Ser. No. 288,505

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—194 **8 Claims**

4. Word line selection circuitry for forming 2^n word line inputs from circuit inputs comprising:

associated with each of said n circuit inputs:

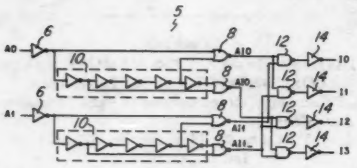
first and second logic gates;

an inverter chain having its output connected to said second logic gate;

each circuit input connected to its associated first logic gate and to its associated inverter chain;

a first output of a first inverter in said inverter chain connected to said first logic gate, said first output having a logic state the same as the logic state of the input to said inverter chain;

a second output of a second inverter in said inverter chain connected to said second logic gate, said second output



being other than the output of said inverter chain, and having a logic state that is the complement of the logic state of the input to said inverter chain;

combining means for logically combining the output of at least said first logic gate associated with one of said n circuit inputs with the output of at least one of said first or second logic gates associated with another of said n circuit inputs.

4,985,866

COMPOUND SEMICONDUCTOR MEMORY DEVICE HAVING REDUNDANT CIRCUIT CONFIGURATION

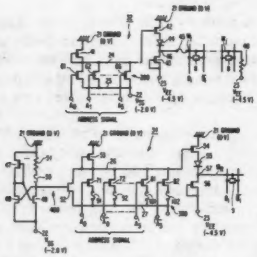
Kazuo Nakazumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 26, 1989, Ser. No. 385,118

Claims priority, application Japan, Jul. 26, 1988, 63-186015

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—200 **10 Claims**



1. A compound semiconductor memory device comprising;

a primary memory cell section including a plurality of primary memory cells;

a redundant memory cell section including a plurality of redundant memory cells;

a plurality of primary decoders;

at least one redundant decoder;

a plurality of primary column lines each formed in said primary memory cell section, coupled to corresponding said primary memory cells and connected to corresponding said primary decoder;

at least one redundant column line formed in said redundant memory cell section, coupled to corresponding said redundant memory cells and connected to said redundant decoder; and

first and second power voltage lines;

each of said primary decoders including a NOR gate circuit connected between first and second common lines and inputted address signals, a first transistor connected to said first common line, a first fuse element connected between said first transistor and said first power voltage line so as to form a series connection with said first transistor, a second transistor connected between said first and second common lines and connected to said second power voltage line.

4,985,867

SEMICONDUCTOR MEMORY CIRCUIT

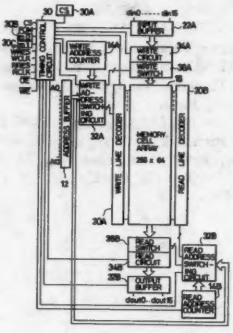
Toshikazu Ishii, Chiba, and Norimitsu Sako, Funabashi, both of Japan, assignors to Kawasaki Steel Corporation, Japan

Filed Sep. 11, 1989, Ser. No. 405,026

Claims priority, application Japan, Sep. 14, 1988, 63-230745; Feb. 20, 1989, 1-39787

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—221 **9 Claims**



1. A semiconductor memory circuit capable of changing the numbers of bits and words associated therewith, the circuit comprising:

chip control means for at least selecting a bit construction corresponding to the number of bits per word and for switching between a random access memory function and a first-in first-out memory function;

an address buffer for altering an effective address length on the basis of the selected bit construction;

an address counter for counting up a write address or a read address in each write or read operation when the first-in first-out memory function has been selected;

a memory cell array;

column and line decoders each for controlling said memory cell array on the basis of the selected bit construction; and

an input/output for changing an effective data length on the basis of the selected bit construction.

4,985,868

DYNAMIC RANDOM ACCESS MEMORY HAVING IMPROVED REFRESH TIMING

Tomio Nakano, Kawasaki, and Hidenori Nomura, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu VLSI Limited, Kasugai, both of, Japan

Continuation of Ser. No. 89,460, Aug. 26, 1987, abandoned. This application Dec. 14, 1989, Ser. No. 449,427

Claims priority, application Japan, Aug. 27, 1986, 61-198938

Int. Cl.[5] G11L *7/00*

U.S. Cl. 365—222 **7 Claims**

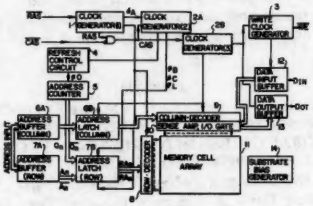
1. A dynamic random access memory comprising:

a memory cell array constituted by a plurality of dynamic type memory cells;

refresh address generating means for internally generating a refresh address signal;

external address receiving means for receiving an external address signal;

clock generating means for receiving a first external clock signal and a second external clock signal, for generating a first internal clock signal when said first external clock signal is input substantially earlier than said second external clock signal, and for generating a second internal clock signal when said second external clock signal is input nearly simultaneous with or earlier than the first external clock signal, a time interval from the input of said first external clock signal until the generation of said second internal clock signal being longer than a time interval



from the input of said first external clock signal until the generation of said first internal clock signal; and

address latch means, having a first and second input gates, for selectively latching either said external address signal through said first input gate or latch of said refresh address signal through said second input gate, and said first input gate being controlled by said first internal clock signal and said second input gate being controlled by said second internal clock signal, wherein latching of said refresh address signal to said address latch means at a refresh mode is performed in a timing later than the latching of said external address signal at a read/write mode.

4,985,869

SEMICONDUCTOR MEMORY DEVICE WITH AN IMPROVED SUBSTRATE BACK-BIAS ARRANGEMENT

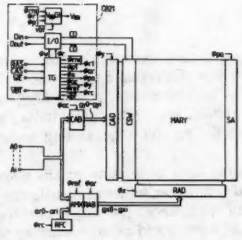
Eiji Miyamoto, Ohme, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 5, 1989, Ser. No. 375,492

Claims priority, application Japan, Jul. 5, 1988, 63-167575; Jul. 5, 1988, 63-167576

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—226 **7 Claims**



1. A semiconductor memory device having a normal operation mode and refresh mode comprising:

a first external terminal for receiving a row address strobe signal ($\overline{RAS}$);

a second external terminal for receiving a column address strobe signal ($\overline{CAS}$);

a first control means coupled to said first and second external terminals for initiating said refresh mode in response to said column address strobe signal being at a logic "low" level when said row address strobe signal is at a transitional logic level corresponding to a falling edge;

a first back-bias voltage generation means coupled to a substrate of said semiconductor memory device for biasing said substrate with a first current supply capacity;

a second back-bias voltage generation means coupled to said substrate for biasing said substrate with a second current supply capacity;

a second control means coupled to said first control means and to said first and second back-bias voltage generation means for placing said first back-bias voltage generation means in an operation state in response to the first control means initiating said refresh mode during a predetermined time, and for placing said second back-bias voltage generation means in a non-operation state during said refresh mode.

4,985,870

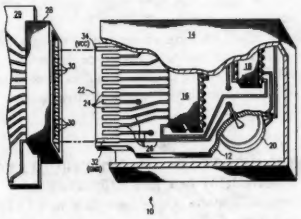
APPARATUS FOR CONNECTING ELECTRONIC MODULES CONTAINING INTEGRATED CIRCUITS AND BACKUP BATTERIES

Anthony B. Faraci, The Colony, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 881,137, Jul. 2, 1986, abandoned. This application Dec. 22, 1988, Ser. No. 290,825

Int. Cl.[5] G11C *5/06, 8/00*

U.S. Cl. 365—228 **11 Claims**



1. An apparatus for storing electronic data, which can be disconnected from an external circuit and reconnected again without losing data and without receiving external electrical power, comprising:

a memory;

a power supply;

a voltage controller circuit, which, selectively,

connects power from an external source to said memory, or

connects backup electrical power from said battery to said memory for retaining said electronic data in said memory when power from the external source is interrupted;

connection means for mating with the external circuit to provide power and logic signal connections between the apparatus and the external circuit; and

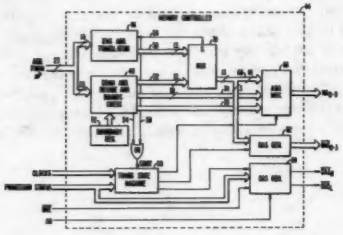
said connection means including conductive traces of unequal length, disposed in a mechanical sequencing relation which causes at least one of the power connections to be physically made before any of the logic connections are physically made.

4,985,871

MEMORY CONTROLLER FOR USING RESERVED DRAM ADDRESSES FOR EXPANDED MEMORY SPACE

Robert W. Catlin, Santa Clara, Calif., assignor to Chips and Technologies, Inc., San Jose, Calif.

Filed Nov. 13, 1989, Ser. No. 435,323
Int. Cl.[5] G11C 7/00, 11/407, 11/408
U.S. Cl. 365—230.06 6 Claims



2. A memory control circuit for controlling access to a memory, comprising:

first memory decode means, coupled to an address bus, for providing a first memory timing enable signal when an address on said address bus within a first predetermined range of addresses and is not within a reserved group of addresses within said first range of addresses;

expanded memory space (EMS) decode means, coupled to said address bus, for providing a translated address and an EMS timing enable signal when an address on said address bus is within a second predetermined range of addresses;

memory control signal generation means, responsive to either said first memory timing enable signal or said EMS timing enable signal, for providing memory control signals to access said memory;

whereby said EMS decode means provides translated addresses within said reserved group of addresses; and

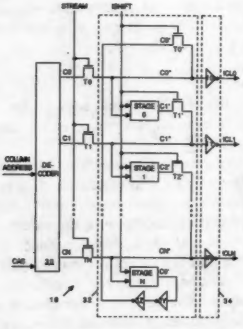
wherein said EMS timing enable signal is generated from a page enable bit in an EMS translation register.

4,985,872

SEQUENCING COLUMN SELECT CIRCUIT FOR A RANDOM ACCESS MEMORY

John B. Halbert, III, Aloha, Oreg., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Jun. 23, 1989, Ser. No. 376,302
Int. Cl.[5] G11C 8/04
U.S. Cl. 365—230.09 17 Claims



1. A sequencer circuit for sequentially asserting a set of output signals, starting with an output signal identified by a particular input value, the circuit comprising:

decoder means for producing a parallel bit output word in response to receipt of said input value;

a plurality of circuit nodes respectively corresponding to bits of said output word;

means for concurrently delivering bits of the decoder means output word to respective circuit nodes and for selectively isolating the decoder means output word from said circuit nodes;

shifting means coupled between circuit nodes corresponding to adjacent bits of said output word for selectively shifting bits of data between said circuit nodes; and

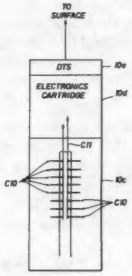
driver means coupled to said circuit nodes for generating said output signals in response to data at said circuit nodes.

4,985,873

METHOD AND APPARATUS FOR DETERMINING COMPRESSIONAL FIRST ARRIVAL TIMES FROM WAVEFORM THRESHOLD CROSSINGS PROVIDED BY APPARATUS DISPOSED IN A SONIC WELL TOOL

Kevin A. Eyl, Boulogne; Andrew L. Kurkjian, Saint Cloud, both of France; David J. Lineman, Houston, Tex.; Edward A. Pierce, Houston, Tex., and Joseph M. Steiner, Jr., Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 20, 1989, Ser. No. 425,661
Int. Cl.[5] G01V 1/40
U.S. Cl. 367—27 15 Claims



1. A well logging system including a well tool adapted to be disposed in a borehole traversing a formation and a computer system adapted to be disposed in a well logging truck at a surface of the borehole, said well tool including a plurality of receivers, each of the receivers generating an analog signal, comprising:

threshold crossing data generation means disposed in said well tool and responsive to the analog signals for generating a plurality of threshold crossing events for each of the analog signals, a threshold event occurring when an analog signal from a particular receiver crosses a threshold, said threshold crossing data generation means including,

first means responsive to the analog signals for determining when each of the analog signals associated with each of the receivers cross a threshold and for generating a first bit when an analog signal crosses said threshold a first time and generating a second bit when the analog signal fails to cross said threshold said first time, said first means changing said first bit to a second bit when said analog signal crosses said threshold a second time and failing to

change said first bit to said second bit when said analog signal fails to cross said threshold said second time, and

second means responsive to the first and second bits generated in association with each analog signal by said first means for determining when a first bit changes to a second bit and when a second bit changes to a first bit, for generating another first bit when said first bit changes to said second bit or when said second bit changes to said first bit, and for generating another second bit when said first bit fails to change to said second bit or when said second bit fails to change to said first bit,

a plurality of the another first bits associated with each of the analog signals representing said plurality of threshold crossing events; and

first arrival time determination means disposed in said computer system and responsive to said threshold crossing events associated with each of said receivers of said well tool for determining a first arrival time at each of said receivers of a compressional wave propagating in said formation,

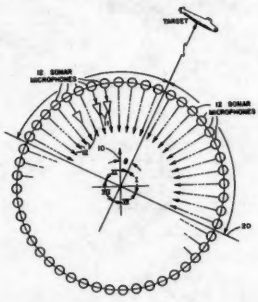
wherein the first arrival times are used to calculate a slowness of said compressional wave, the slowness being representative of a characteristics of the formation in said borehole.

4,985,874

SOLID STATE SEQUENCING SWITCH

Eugene R. Roeschlein, Indianapolis, Ind., assignor to The United States of America, as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1971, Ser. No. 137,599
Int. Cl.[5] G01S *3/80*
U.S. Cl. 367—122 **6 Claims**



1. A solid state sequencing switch in a digital processing system of a sonar detector comprising:

a plurality of sonar microphones equidistantly spaced about a circle on a vehicle station;

two channels, each channel having a switch array module, a demultiplexer, a resistance bank, a delay line, a configuration matrix, a coupling amplifier, and a line driver in series in that order with said plurality of sonar microphone outputs coupled in common as inputs to each switch array module, and the output of each channel taken from each line driver to provide left and right beam signal voltages on said outputs;

decoder modules coupled through switch driver modules to said switch array modules in each channel in parallel, said decoder modules adapted to be coupled to the "coarse" output of the digital processor to produce selection of sonar microphones nearest the axis to a noise making target;

a read only memory to store the switching instructions and having as an input the "fine" output of the digital processor and having the coded outputs coupled in parallel to each demultiplexer;

a parallel adder having an output coupled to said read only memory input and an input adapted to be coupled to the "fine" output of the digital processor to access portions of the read only memory which store the switching instructions for various sound velocities;

a summing amplifier having two inputs coupling, respectively, the left and right channel outputs and having an output; and

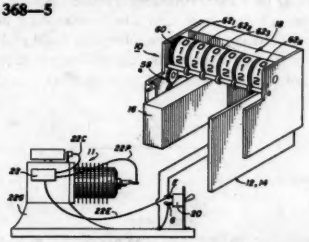
a configuration matrix coupling the outputs of each said first and second channels after beam forming and said summing amplifier to provide left beam, right beam, and the sum of the beam voltages as outputs for a display console whereby a sounding target will be displayed as to its position with respect to said vehicle station.

4,985,875

ENGINE OPERATING TIME HOUR METER

Paul Mitchell, Glenview, Ill., assignor to ENM Company, Chicago, Ill.

Filed Nov. 3, 1989, Ser. No. 431,470
Int. Cl.[5] G04F *8/00*
U.S. Cl. 368—5 **12 Claims**



1. An engine operating time measuring apparatus for use with an engine having an internal magneto-type electrical generator providing an ignition voltage, said apparatus comprising:

means connected to the internal magneto-type electrical generator of the monitored engine for supplying operating power to said apparatus; said operating power supplying means being connected in parallel across an engine enable switch; said engine enable switch being connected between ground potential and an enable input of an electronic ignition module of the monitored engine; said operating power supplying means deriving operating power completely from the internal magneto-type electrical generator of the monitored engine;

timing means responsive to said operating power supplying means for generating a clock signal; and

counter means responsive to said clock signal for counting said generated clock signal to identify the engine operating time.

4,985,876

GLOBAL CLOCK APPARATUS

Rafael Vàzquez, Box 307 Fishkill Correctional Facility, Beacon, N.Y. 12508

Filed May 24, 1990, Ser. No. 527,848
Int. Cl.[5] G04B *19/22*
U.S. Cl. 368—23 **6 Claims**

1. A global clock apparatus comprising, in combination,

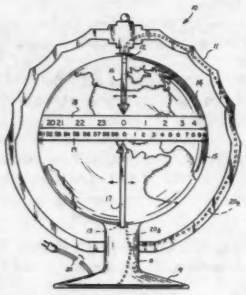
a circular frame, the circular frame including a top pivot axis mounted to an uppermost portion of the circular frame, and

a bottom pivot axis mouted to a lowermost portion of the circular frame, wherein the top and bottom pivot axes are coaxially aligned relative to one another, and

a top hemisphere fixedly mounted to the top pivot axis, and

a bottom hemisphere fixedly mounted to the bottom pivot axis, and

a top indicator arrow pivotally mounted to the top pivot axis, and a bottom indicator arrow pivotally mounted to the bottom pivot axis, and



a top annular time band rotatably mounted between the top and bottom hemisphere, and a bottom annular time band mounted between the top annular time band and the bottom hemisphere, wherein the top and bottom annular time bands are rotatable relative to one another.

4,985,877

ELECTRONIC WATCH WITH MOVING MEMBER

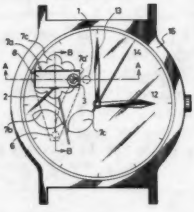
Tooru Namisato, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Continuation of Ser. No. 243,594, Sep. 12, 1988, Pat. No. 4,839,874. This application Apr. 24, 1989, Ser. No. 342,121

Claims priority, application Japan, Sep. 17, 1987, 62-141817[U]; Dec. 22, 1987, 62-195638[U]

Int. Cl.[5] G04B *19/00, 19/06*

U.S. Cl. 368—76 **17 Claims**



1. In an electronic analog timepiece having a dial plate having a front face: a step motor having a rotor rotationally driven in a stepwise manner as a function of time, the rotor having at least two magnetic poles of opposite polarity which exert a magnetic force; a decorative magnetic member movably disposed within the range of influence of the magnetic force exerted by the rotor and disposed to be visible at the front face of the dial plate; and means mounting the decorative magnetic member to undergo movement within the range of influence of the magnetic force exerted by the rotor to enable the magnetic force exerted by the rotor to effect movement of the decorative ma[illegible]tic member in response to stepwise rotation of the rotor.

4,985,878

ELECTRONIC TIMEPIECE WITH ANALOG TIME DISPLAY UNIT AND ELECTROOPTIC DATA DISPLAY UNIT

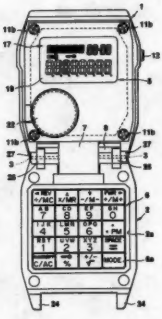
Wataru Yamada, Tachikawa; Yukio Kido, Fussa; Hiroyuki Abe, Fussa; Shunji Minami, Fussa; Shigeru Katoh, Tachikawa, and Junro Yano, Fussa, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 403,304, Sep. 5, 1989, abandoned. This application Nov. 27, 1989, Ser. No. 443,081

Claims priority, application Japan, Sep. 12, 1988, 63-226576; Dec. 27, 1988, 63-168654[U]; Mar. 6, 1989, 1-24715[U]; Mar. 17, 1989, 1-29828; Mar. 20, 1989, 1-30798[U]; Mar. 20, 1989, 1-30793; Mar. 20, 1989, 1-30794; Jun. 29, 1989, 1-165294

Int. Cl.[5] G04B *25/00, 19/00*

U.S. Cl. 368—88 **14 Claims**



1. An electronic wrist watch having an analog time display unit and an electrooptic data display unit, comprising:

a single flat plate member having an upper surface on which a switch input section for data input is mounted, and a lower surface which is contacted with a user's hand;

a case member which is attached to one end of said plate member so as to be freely opened and closed over said plate member, said switch input section being exposed for operation by a user when said case member is opened;

an analog time display unit, housed in said case member at an upper surface thereof, for displaying time with hands;

an electrooptic data display unit, housed in said case member at a lower surface thereof, for displaying data; and

an electronic circuit, housed in said case member, for driving said analog time display unit, said electronic circuit being electrically connected to said switch input section so as to cause said electrooptic data display unit to display data input from said switch input section; wherein

said analog time display unit comprises an analog movement for driving said hands;

said analog movement and said electrooptic data display unit

are arranged in said case member so as to be vertically stacked on each other;

a battery is provided in said case member for driving said analog time display unit and said electrooptic data display unit; and

said electronic circuit is arranged abreast of said analog movement and said electrooptic data display unit so as not to be stacked thereon.

4,985,879

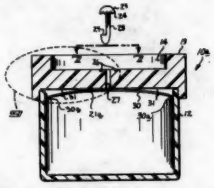
INDICATOR LID APPARATUS

Connie S. Owens, Rte. 3, Box 68, Cleveland, Okla. 74020

Filed Jan. 25, 1990, Ser. No. 470,378

Int. Cl.[5] G04F *1/00*; G09F *9/00*

U.S. Cl. 368—89 **6 Claims**



1. An indicator lid apparatus in combination with an underlying container, wherein the lid comprises,

an annular lid including a planar perimeter top surface and a recessed central cavity oriented medially of the top surface and coaxially of the lid,

and

a first and second indicator arm rotatably mounted to a hub, wherein the hub is coaxially mounted relative to the central cavity,

and

a first and second array of numbers associated with the respective first and second indicator arm for indication of a timing event relative to contents positioned within the underlying container,

and

wherein the central cavity defines a central cavity planar floor, and the lid further includes a lower cavity underlying the central cavity, wherein the underlying cavity includes an underlying floor oriented below and generally parallel to the central floor defined by the central cavity,

and

wherein the first and second indicator arms are of different lengths for ease of visual recognition of the respective first and second indicator arms,

and

wherein the hub includes a reciprocatable shaft directed through an aperture coaxially formed through the lid extending through the underlying floor, and the hub further includes a hemispherical shield coaxially mounted to an upper end of the reciprocatable shaft, wherein the hemispherical shield includes a scalloped perimeter edge including a predetermined number of projections spaced about a like predetrmined number of recesses, wherein the first and second indicator arms are latched between the projections within the recesses when the scalloped perimeter edge is positioned downwardly against the central floor.

4,985,880

OPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS

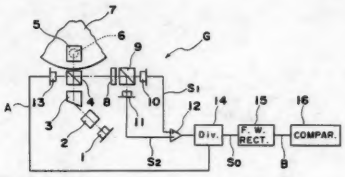
Yoshio Yoshida; Nobuo Ogata, both of Tenri; Mitsuo Ishii, Yamatokoriyama; Yukio Kurata, Tenri; Yasuo Nakata, Tenri; Takayuki Inoue, Nara, and Kazuko Inoue, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 21, 1988, Ser. No. 247,355

Claims priority, application Japan, Sep. 21, 1987, 62-236756

Int. Cl.[5] G11B *13/04, 11/10, 11/12*

U.S. Cl. 369—13 **7 Claims**



1. An optical information recording and reproducing apparatus comprising:

a light emitting means for emitting an information bearing light signal;

a focusing means for collecting said light emitted from said light emitting means onto a magneto-optical recording medium by raising the temperature at a selected portion of said magneto-optical recording medium above Curie temperature to magnetize that portion of said recording medium for recording information;

analyzing means for separating the light reflected from the magneto-optical recording medium into polarized components in two directions corresponding to the magnetizing direction in the magnetized portion of said magneto-optical recording medium;

first and second photo-detecting means for converting said polarized light components into electrical signals for obtaining reproduction signals from the information recorded on said magneto-optical medium;

third photo-detector means for converting light received from said light emitting means before reflected by said recording medium into an electrical signal;

said optical information recording and reproducing apparatus further comprising subtracting means for producing an electrical signal by subtracting the information signal obtained by each respective first and second photo-detecting means during the recording function, and by dividing the difference by the value of the signal produced by said third photo-detector means;

waveform shaping means for adjusting the waveform of an output signal from said subtracting means; and

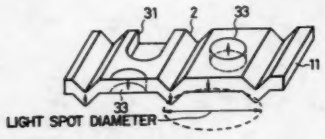
a comparing means for comparing the output signal of said waveform shaping means with a preliminary set of threshold values to identify recording errors.

4,985,881

RECORD CARRIER FOR A MAGNETO-OPTICAL DISC MEMORY HAVING GUIDE GROOVES OF A PLURALITY OF TRACKS DISPOSED WITH A PREDETERMINED RELATION TO LIGHT SPOT DIAMETER

Atsushi Saito, Ichikawa; Masahiro Ojima, Tokyo, and Masaru Ito, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 685,123, Dec. 21, 1984, abandoned.
This application May 21, 1987, Ser. No. 53,564
Claims priority, application Japan, Dec. 23, 1983, 58-242006; Jun. 29, 1984, 59-133156
Int. Cl.[5] G11B *11/12, 13/04, 7/24*
U.S. Cl. 369—13 18 Claims



1. A record carrier for a magneto-optical disc memory for enabling detection of a tracking signal and at least one of recording, reproducing and erasing information by application of a light beam providing a light spot having a predetermined diameter, comprising:

a circular disc-like substrate;

a record layer which is formed on said substrate and used for writing information by changing the direction of magnetization; and

guide groove means of a plurality of tracks formed in advance and extending in the radial direction of said substrate with flat portions therebetween;

each flat portion between said tracks of said guide groove means being divided into a plurality of sectors, each sector including a header portion in which a header signal containing an address for distinguishing at least a respective sector formed in advance with pits of a phase structure and a data portion adjacent to said header portion; and

said guide groove means adapted to serve as an optical guide for the light spot of the light beam adapted to at least one of record, reproduce and erase said information on said data portion, said tracks of said guide groove means being disposed at an approximately constant pitch which is smaller than the predetermined diameter of the light spot of the light beam adapted to at least one of record, reproduce and erase.

4,985,882

TRACK ACCESS CONTROL SYSTEM FOR DISK SYSTEM, HAVING ECCENTRICITY CORRECTION MEANS

Shigeyoshi Tanaka, and Shigenori Yanagi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 19, 1989, Ser. No. 299,018
Claims priority, application Japan, Jan. 19, 1988, 63-008799; Jan. 22, 1988, 63-012315
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.32 27 Claims

1. A track access control system for use in a disk storage system including: a rotatable recording disk having a plurality of tracks, on which data is recorded and from which data is read, formed along a rotation direction of the rotatable disk; a data recording and reading head movable in a radial direction across the disk; track actuator means for moving the head in a radial direction of the disk; and a track error sensor for detecting a track error signal in response to a signal read through the head, said control system comprising:

track servo control means, operatively connected to the track error sensor and the track actuator means, for positioning the head at a desired position through the track actuator means in response to the track error signal from the track error sensor; and

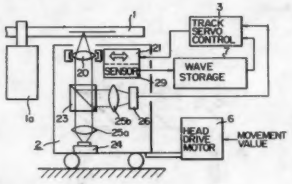
eccentricity correction means, operatively connected to the track error sensor, and operatively connected to said track servo control means to cooperate therewith, for detecting an eccentricity of one of the tracks at a first condition, storing said eccentricity, and compensating said eccentricity of the track together with said track servo control means at a second condition after said first condition, said eccentricity correction means comprising:

eccentricity detecting means for detecting said eccentricity and producing eccentricity data in response to a deviation of the track for at least a half rotation of said disk;

eccentricity wave signal storage means for storing digital eccentricity data and comprising:

a memory;

an address generation circuit operatively connected to said memory;



a filter connected to an output of said memory; and

a comparator having a first input connected to an output of said filter, a second input connected to said eccentricity detecting means to receive said eccentricity data, and an output connected to an input of said memory;

said address generation circuit generating an address for said memory in response to a rotation of said disk, said filter producing an analog reproduction eccentricity wave signal in response to data stored in said memory, said comparator comparing said analog reproduction eccentricity wave signal with said received eccentricity and outputting the digital eccentricity data comprising a polygonal line shaped sinusoidal eccentricity signal; and

eccentricity compensation means for receiving said analog reproduction eccentricity wave signal from said filter and adding said received reproduction eccentricity wave signal to the track error signal compensating said eccentricity.

4,985,883

APPARATUS FOR IMPARTING SOUND AND MOVEMENT TO AN ORNAMENT

Jack Hou, P.O. Box 78-95, Taipei, Taiwan

Filed Jun. 9, 1988, Ser. No. 204,514
Int. Cl.[5] G11B *31/00*
U.S. Cl. 369—69 1 Claim

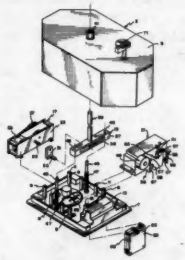
1. An apparatus for imparting movement to an ornament and providing musical accompaniment to the movement comprising:

(a) a hollow casing including an upper side and a bottom side;

(b) a base including a top portion and a bottom portion, the base being secured to the bottom side of the casing, the top portion of the base and the interior of the casing collectively defining a compartment therebetween, and the bottom portion of the base including leg means for engaging a support surface and spacing the bottom portion therefrom;

(c) an electric power drive source including an output shaft, a cam follower, a transmission mechanism including an eccentric cam means driven by the output shaft, a cam follower, and the eccentric cam means being disposed in driving engagement with the cam follower for imparting vertical movement thereto during operation of the power drive source when the leg means is in engagement with the support surface;

(d) a tape cassette player supported on the top portion of the base, the bottom portion of the base including a channel disposed in alignment with the tape cassette player for receiving a tape cassette through the bottom portion and positioning the tape cassette in playing engagement with the tape cassette player;



(e) an electric power supply for operating the power drive source and the tape cassette player;

(f) switch means for activating and deactivating power drive source and tape cassette player; and

(g) a tappet rod including a first end disposed interiorly of the casing and carried by the cam follower for imparting a corresponding vertical movement to the tappet rod during vertical movement of the cam follower, and a second end disposed exteriorly of the casing for mounting an ornament thereon, whereby vertical movement imparted to the tappet rod by the cam follower imparts a corresponding vertical movement to the ornament.

4,985,884

DISK SHAPED RECORDING REPRODUCTION DEVICE

Hidetaka Watanabe, and Kanji Fukunaga, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,457

Claims priority, application Japan, Nov. 2, 1987, 62-168228[U]

Int. Cl.[5] G11B *3/60*

U.S. Cl. 369—263 **4 Claims**

1. A disk shaped recording reproduction device including a turntable upon which a disk is loaded, a pickup which reads information recorded on said disk, a deck base supported by a damper, a clamp arm pivoted to said deck base in such a way that it moves freely up and down, and a clamp which is attached to a free end of said clamp arm to hold said disk between itself and said turntable, wherein the improvement comprises:

an elastic body for said damper which has good vibration damping characteristics within a certain temperature range;

a heater for applying heat to said elastic body; and

a control device for controlling said heater so that the temperature of said elastic body remains within said temperature range.

4,985,885

OPTICAL MEMORY DEVICE

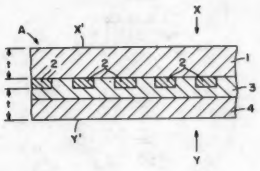
Kenji Ohta; Akira Takahashi; Hiroyuki Katayama; Junji Hirokane, all of Nara, and Yoshiteru Murakami, Nishinomiya, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 30, 1988, Ser. No. 213,817

Claims priority, application Japan, Jul. 1, 1987, 62-164443; Jul. 1, 1987, 62-164444

Int. Cl.[5] G11B *7/24*

U.S. Cl. 369—275.1 **5 Claims**



1. An optical memory device comprising a first light-permeable substrate, a second light-permeable substrate and at least one strip-shaped optical recording layer that is disposed within a gap between the first substrate and the second substrate, wherein the optical path length from the outer surface of said first substrate to said recording layer is approximately equal to the optical path length from the outer surface of said second surface to said recording layer.

4,985,886

TRANSMISSION LINE BRANCHING DEVICE

Toshihiko Yomogida; Akira Uchida, both of Kariya; Goro Kobayashi, Okazaki, and Hisanori Nakamura, Toyota, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 12, 1989, Ser. No. 420,378

Claims priority, application Japan, Nov. 25, 1988, 63-298946

Int. Cl.[5] H04B *10/02*

U.S. Cl. 370—1 **8 Claims**

1. A transmission line branching device adapted to be interposed among three half duplex transmission lines for sending out an electrical signal, which is received at an arbitrary one of three terminals thereof individually connected with said half duplex transmission lines, through the other two terminals to the corresponding two transmission lines connected therewith, comprising:

three receivers individually provided for said terminals and each adapted to receive, by way of a corresponding one of said terminals, an electrical signal propagated over a corresponding one of said half duplex transmission lines;

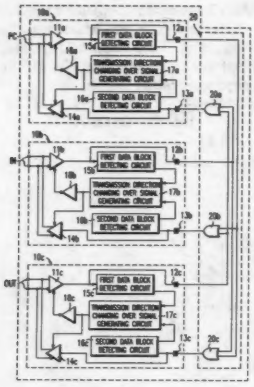
three drivers individually provided for said terminals and each adapted to sent out, by way of a corresponding one of said terminals, an electrical signal to a corresponding one of said half duplex transmission lines;

first photo-couplers individually connected with said receivers and each adapted to convert an electrical signal received from a corresponding one of said receivers into an optical signal and convert the optical signal again into an electrical signal;

second photo-couplers individually connected with inputs of said drivers and each adapted to deliver an electrical signal to a corresponding one of said drivers;

a distributing circuit for connecting an output of one of said first photo-couplers corresponding to an arbitrary one of said terminals with those of said second photo-couplers corresponding to the other two terminals;

three data block detecting means individually provided for said receivers and each adapted to detect the head of a data block of communication data received by way of a corresponding one of said receivers and generate, after



such detection of the head, a signal which specifies the length of the data block; and

a data reception/sending changing over means responsive to an output signal of an arbitrary one of said data block detecting means when a data block of communication data is detected by the arbitrary data block detecting means, for inhibiting reception of communication data by way of the other two terminals and enabling sending of the communication data from the other two terminals.

4,985,887

SYSTEMS FOR SELECTING A TRANSMISSION CONTROL PROCEDURE IN COMMUNICATIONS USING INTEGRATED SERVICES DIGITAL NETWORKS

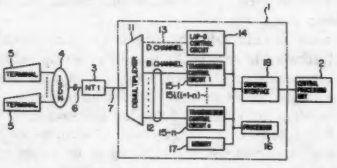
Noboru Mizuhara, Kawasaki, and Kansuke Kuroyanagi, Yokohama, both of Japan, assignors to Thomson Composants Microondes, Puteaux, France

Filed Dec. 12, 1989, Ser. No. 448,922

Claims priority, application Japan, Dec. 14, 1988, 63-315662

Int. Cl.[5] H04J *3/14*

U.S. Cl. 370—58.2 **8 Claims**



1. A transmission procedure selecting process in a data communication network system which includes a plurality of terminals, an ISDN switching network which exchanges a plurality of circuit lines with the plurality of terminals, a communication control device connected with the ISDN switching network via a multiplexed signal interface for providing circuit control for signals transmitted through the interface, the communication control device including a plurality of transmission control circuits, each being connected to a data channel, a central processing unit connected to the communication control device, comprising:

a step that prior to transmission of data from a terminal to the central processing unit, said terminal transmits a call setup signal which designates the transmission control procedure adaptive to said terminal via a control channel of the multiplexed interface;

a step that the central processing unit selects transmission control circuit designated by the transmission control procedure in said call setup signal received via the control channel; and

a step that the central processing unit transmits to the ISDN switching network via the control channel of the multiplexed interface a request for connection of the terminal and the data channel connected to the selected transmission control circuit.

4,985,888

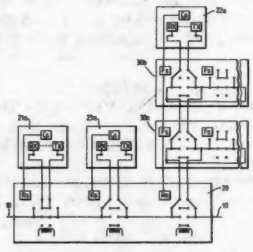
TOKEN RING SYSTEM HIERARCHY

Robert Madge, Giles, and David Woodfield, Walsall, both of England, assignors to Madge Networks Limited, Great Britain

Continuation-in-part of Ser. No. 177,764, Apr. 5, 1988, Pat. No. 4,905,230. This application Dec. 14, 1989, Ser. No. 451,118

Int. Cl.[5] H04J *3/00*

U.S. Cl. 370—85.5 **3 Claims**



1. A communications network comprising a plurality of computer communications systems, all operating within the constraints of token ring protocols, said systems being arranged in a hierarchy which operationally defines a single, shared, token ring, said network further comprising

(a) at least one token ring hub;

(b) a token ring LAN system into which said hub is connected to form a subsidiary hierarchal level, each said token ring hub further comprises means adapted to receive a signal indicative that the requirements of the standard token ring protocols are satisfied with respect to a computer having a token ring adapter card connected to the hub and, in response to said signal, said means transmits a comparable signal to said token ring LAN system into which the hub is inserted in hierarchal succession, the transmitted signal being likewise indicative that the requirements of the intrinsic token ring protocols are satisfied with respect to the connection of the hub per se into said token ring LAN system.

4,985,889

DATA PACKET SWITCHING

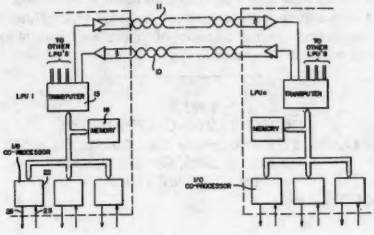
Anthony J. Frankish; Ian B. Stewart, and John A. Stockdale, all of Poole, England, assignors to Sprint International Communications Corporation, Reston, Va.

Filed Feb. 2, 1989, Ser. No. 305,087

Claims priority, application United Kingdom, Feb. 4, 1988, 8802533

Int. Cl.[5] H04J 3/24; H04Q 11/04

U.S. Cl. 370—94.1 5 Claims



1. A packet switch for a fast packet asynchronous time division switching system, the fast packet switching generating switch control cells in the form of short data packets containing control information and message information, said system including a high bandwidth asynchronous switch having a throughput substantially greater than the average traffic connected through it; said high bandwidth asynchronous switch comprising

a plurality of switching elements,

means for providing minimum delay to the data packets being switched therethrough,

means for connecting the switching elements in a point-to-point matrix switch configuration, said connecting means including multiple duplex serial links for each switching element for transmitting and receiving data packets to and from the other switching elements in the matrix,

switch interface means for tagging the control information of said switch control cells with a destination ID byte including a special bit,

said switching elements further including means for recognizing said special bit, and means responsive to recognition of the special bit for routing said switch control cells through the matrix from a source switching element to a destination element along the point-to-point links.

4,985,890

DATA TRANSMISSION UNIT

Satoshi Matsumoto, Nara; Daisuke Azuma, Tenri, and Souichi Miyata, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1988, Ser. No. 260,068

Claims priority, application Japan, Oct. 20, 1987, 62-265738; Oct. 20, 1987, 62-265739; Oct. 20, 1987, 62-265742; Jan. 22, 1988, 63-12783; Jan. 22, 1988, 63-12784; Jan. 22, 1988, 63-12785; Mar. 17, 1988, 63-65514; Mar. 17, 1988, 63-65515

Int. Cl.[5] H04J 3/24, 3/02

U.S. Cl. 370—94.1 14 Claims

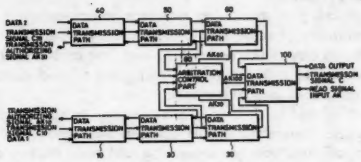
14. A method for transmitting data from a first transmission path to a second transmission path in response to a control transmission authorizing signal supplied from the second transmission path, comprising the steps of:

(a) transmitting data to a first input-side transmission path in response to a first transmission authorizing signal;

(b) transmitting data to a second input-side transmission path provided in parallel with said first input-side transmission path in response to a second transmission authorizing signal;

(c) transmitting data outputted from said first and second input-side transmission paths to an output-side transmission path in response to the control transmission authorizing signal from the second transmission path;

(d) determining whether or not data is present in said first and second transmission paths; and



(e) outputting said first transmission authorizing signal for said first input-side transmission path and said second transmission authorizing signal for said second input-side transmission path in response to the control transmission authorizing signal from said output-side transmission path according to a degree of data occupancy of said first and second input-side transmission paths.

4,985,891

ISDN SYSTEM HAVING SUBSCRIBER LINE MULTIPLEXER WITH MEANS FOR ESTABLISHING DIFFERENT DATA LINKS THROUGH D-CHANNELS ON SUBSCRIBER LINE AND HIGH RATE TRANSMISSION LINE

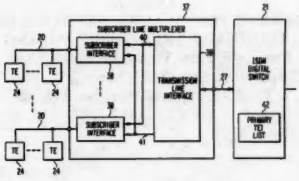
Ryuhei Fujiwara; Yasuo Fukazawa, both of Tokyo, and Takashi Asano, Miyagi, all of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 290,953

Claims priority, application Japan, Dec. 28, 1987, 62-332813; Jan. 18, 1988, 63-7040; Jan. 22, 1988, 63-10867; Oct. 6, 1988, 63-250751

Int. Cl.[5] H04J 3/12, 3/26

U.S. Cl. 370—110.1 6 Claims



1. In an ISDN (Integrated Services Digital Network) system comprising a plurality of subscriber lines associated with a plurality of terminal equipments, a subscriber line multiplexer connected to said plurality of subscriber lines, each of said subscriber lines transmitting a basic TDM (Time Division Multiplex) signal between said plurality of terminal equipments and said subscriber line multiplexer at a basic transmission rate, said terminal equipments having different terminal equipment TEIs (Terminal Endpoint Identifiers) assigned thereto as basic TEIs, respectively, said basic TDM signal comprising a plurality of basic information channels for transmitting information and a basic control channel for transmitting a basic control signal, the basic control signal comprising a specific one of said basic TEIs and control information from a specific one of said terminal equipments, a first ISDN digital switch having a list of TEIs for registering TEIs, and a first high rate transmission line coupling said subscriber line multiplexer and said first ISDN digital switch for transmitting a primary TDM signal therebetween at a primary transmission rate higher than said basic transmission rate, said primary TDM signal comprising a

plurality of primary information channels and a primary control channel, said subscriber line multiplexer statistically multiplexing the basic control channel signals on said plurality of subscriber lines into said primary control channel to thereby transmit said control information to said first ISDN digital switch, the improvement wherein said subscriber line multiplexer comprises:

a plurality of subscriber interface means coupled to said plurality of subscriber lines, respectively; and

internal bus means coupled to said first high rate transmission line and commonly connected to said plurality of subscriber interface means;

each of said subscriber interface means comprising:

channel separating means coupled with each one of said subscriber lines for separating said basic control channel signal from said basic TDM signal to produce a separated signal;

a basic TEI list for memorizing said basic TEIs;

basic control means responsive to said separated signal for deriving said control information as a derived control information, said basic control means establishing a basic data link between said specific terminal equipment and said basic control means through said basic control channel in cooperation with said basic TEI list;

primary control means having a subscriber TEI assigned to said each one of said subscriber interface means as a primary TEI, said primary TEI being registered in said list of TEIs in said first ISDN digital switch as a primary TEI, said primary control means responsive to said derived control information for making a primary control signal which comprises said primary TEI and said derived control information without said specific basic TEI; and

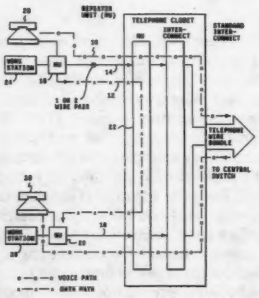
transmitting means for transmitting said primary control signal into said primary control channel through said internal bus in the statistical multiplexing fashion so that a primary data link is established between said primary control means and said first ISDN digital switch through said primary control channel in cooperation with said primary TEI list.

4,985,892

BASEBAND LOCAL AREA NETWORK USING ORDINARY TELEPHONE WIRING

Joseph M. Camarata, Palos Verdes Peninsula, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1984, Ser. No. 616,348
Int. Cl.[5] H04J *1/02*
U.S. Cl. 370—123 **15 Claims**



1. A local area network for communicating between two or more nodes, each node comprising a telephone for generating and receiving voice signals and a workstation for generating and receiving digital signals, said network comprising:

telephone switching means for switching voice signals and data bus means for communicating digital signals, and wherein each node further comprises:

wire means

first means for coupling voice signals, but not digital signals, between said telephone and said wire means,

second means for coupling digital signals, but not voice signals, between said workstation and said wire means,

third means for coupling voice signals, but not digital signals, between said switching means and said wire means, and

fourth means for coupling data signals, but not voice signals, between said data bus means and said wire means,

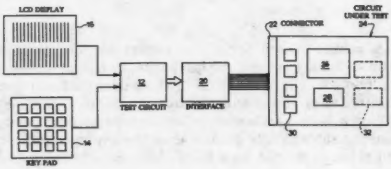
said data signal communications and said voice signal communications being capable of operation simultaneously and without interference.

4,985,893

CIRCUIT TESTING APPARATUS

Daniel Gierke, 1211 Brandywine Cir., Batavia, Ill. 60510

Filed Mar. 3, 1989, Ser. No. 318,554
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—16.2 **4 Claims**



1. An electronic testing apparatus for testing a microprocessor based circuit, said circuit under test including a microprocessor, a ROM memory and a communication bus, the test apparatus comprising:

a control unit including a microprocessor, a display, memory means, and a communication bus, wherein said control unit is arranged to receive diagnostic test results and display information responsive thereto;

an interface unit coupled to the communication bus of said control unit and to said communication bus of said circuit under test, said interface unit being arranged to respond to said control unit and to said circuit under test and to transmit data therebetween;

an insertable ROM memory arranged to be inserted into the circuit under test in place of the pre-existing ROM memory, said insertable ROM memory being programmed with instructions operable by the microprocessor of the circuit under test for testing the circuit under test and providing data output indicating the results of the test; and

wait state test circuitry including a counter responsive to a memory read instruction, circuit means for generating a "Ready" signal to the microprocessor of the circuit under test in response to the memory read instruction and to the state of said counter, such that the "Ready" signal holds the wait state for extended duration if the wait state is operational.

4,985,894

FAULT INFORMATION COLLECTION PROCESSING SYSTEM

Hideoki Suga, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1988, Ser. No. 284,078
Claims priority, application Japan, Dec. 14, 1987, 62-315804
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—16.5 **10 Claims**

2. A communication control processing system for controlling data communication between a central processing system

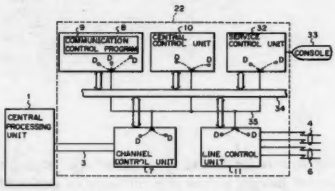
which performs arithmetic and control operations required for data processing and data communication lines, said communication control processing system comprising a plurality of component means and having a fault information collection function, comprising:

channel control means for controlling input and output channels to transfer data between said central processing system and said data communication lines,

first storage means for storing said data, said storage means further including a region for storing a control program,

line control means for controlling transfer of data to and from said data communication lines,

central control means for controlling the operations of the component means in said communication control process-



ing system in accordance with said control program stored in said storage means,

service control means for gathering detailed fault information from said component means and for transferring said fault information to said storage means,

said service control means comprising,

means for gathering detailed fault information from component devices in said communication control processing system,

second storage means for storing said detailed fault information, and

means for transferring said detailed fault information from said second storage means to said central processing system through said channel control means.

4,985,895

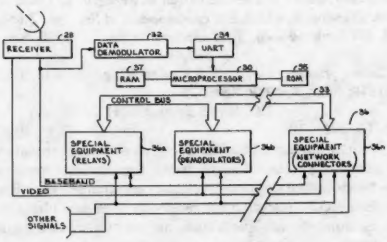
REMOTE CONTROLLED RECEIVING SYSTEM APPARATUS AND METHOD

Gary L. Pelkey, Woodstock, Ga., assignor to Wegener Communications, Inc., Duluth, Ga.

Filed Nov. 14, 1988, Ser. No. 270,143

Int. Cl.[5] G06F *11/10*; G08C *19/00*

U.S. Cl. 371—37.7 **20 Claims**



1. A remote controlled receiving system having a plurality of remote receivers for receiving transmitted digital signals, each remote receiver comprising:

means for reassembling transmitted bytes of data;

a microprocessor for interpreting said reassembled bytes of data according to a predefined protocol to define a desired action; and

an output device connected to said microprocessor;

wherein said microprocessor causes said desired action to be executed by affecting said output device.

4,985,896

LASER DRIVING DEVICE

Junichi Kimizuka, Yokohama; Toshihiko Inuyama, Fujisawa; Takashi Soya, and Yasutaka Noguchi, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

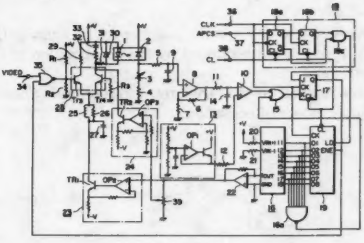
Continuation of Ser. No. 844,331, Mar. 26, 1986, abandoned.

This application Oct. 11, 1988, Ser. No. 256,122

Claims priority, application Japan, Mar. 29, 1985, 60-063882; Mar. 29, 1985, 60-063883; Mar. 29, 1985, 60-063884

Int. Cl.[5] H01S *3/13, 3/00*

U.S. Cl. 372—38 **14 Claims**



1. A laser driving device comprising:

a laser element capable of emitting a laser beam when supplied with a current equal to or exceeding a threshold value;

supply means for supplying a driving current to said laser element, said driving current comprising a switching current component which is turned on and off in accordance with an input signal and a bias current component;

detecting means to detect the quantity of light from said laser element; and

control means for controlling said supply means in accordance with an output from said detecting means, wherein said control means is operable to vary both the switching current and the bias current so as to vary said currents to maintain a constant ratio thereof.

4,985,897

SEMICONDUCTOR LASER ARRAY HAVING HIGH POWER AND HIGH BEAM QUALITY

Dan Botez, Redondo Beach; Michael Jansen, Los Angeles; Luke J. Mawst, Torrance; Gary L. Peterson, Long Beach; William W. Simmons, Rancho Palos Verdes; Jaroslava Z. Wilcox, Los Angeles, and Jane J. J. Yang, Los Angeles, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 7, 1988, Ser. No. 254,905

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—50 **22 Claims**

1. A semiconductor laser array structure, comprising:

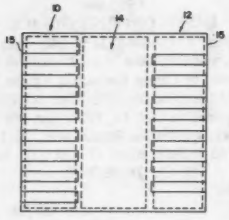
means for producing lasing action in the structure, including at least one substrate, an active semiconductor layer and surrounding cladding layers successively formed on the substrate, electrodes later formed on opposite faces of the substrate, for applying a voltage across the active layer, and a pair of reflective facets, at least one of which is an emitting facet, still later formed at opposite ends of the array structure;

a first set of waveguides with parallel longitudinal axes;

a second set of waveguides with parallel longitudinal axes;

a laterally unguided diffraction region located between the

first and second sets of waveguides, the diffraction region having a length approximately equal to a multiple of one half of the Talbot distance, given by the quantity nd^2/λ, where n is a positive integer, d is the lateral periodic spacing of the waveguides in the first and second sets of



waveguides, and λ is the wavelength of light, in the diffraction region, produced by the lasing action of the device; and

means internal to the structure, for suppressing unwanted array modes of operation.

4,985,898

NARROW-BAND LASER APPARATUS

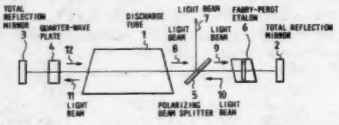
Nobuaki Furuya, Kawasaki; Takuhiro Ono, Zama; Naoya Horiuchi; Keiichro Yamanaka, both of Kawasaki, and Takeo Miyata, Zama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 1, 1990, Ser. No. 487,080

Claims priority, application Japan, Jun. 14, 1989, 1-151789; Nov. 1, 1989, 1-286840; Jan. 12, 1990, 2-4984; Jan. 12, 1990, 2-4985; Jan. 12, 1990, 2-4986

Int. Cl.[5] H01S *3/08*

U.S. Cl. 372—106 **22 Claims**



1. A narrow-band laser appartus comprising:

(a) an optical resonator including first and second reflecting means;

(b) laser medium provided in a light path of said optical resonator for emitting light, said laser medium including an exciting means

(c) polarizing beam splitting means provided between said first reflecting means and said laser medium in said light path for transmitting a first polarizing component therethrough and reflecting a second polarized component of said light;

(d) selection means provided between said first reflecting means and said polarized beam splitting means in said light path for selecting a given wavelength component from said second polarizing component of said light; and

(e) polarizing conversion means provided between said polarizing beam splitting means and said second reflecting means in said light path for producing said first and second polarizing components in response to said light.

4,985,899

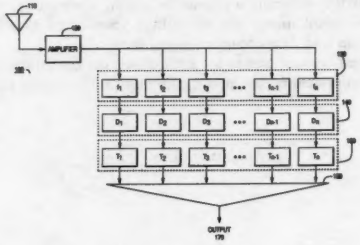
INTERCEPT DETECTOR FOR SPREAD-SPECTRUM SIGNALS

John B. Walsh, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 5, 1989, Ser. No. 417,310

Int. Cl.[5] H04L *9/00*

U.S. Cl. 375—1 **5 Claims**



5. An apparatus for decoding a spread-spectrum frequency hopped signal having pulses in a plurality of different bands, the apparatus comprising:

means for receiving the frequency hopped signal;

a bank of filters, each filter filtering a signal pulse and corresponding background noise in one of the plurality of different bands;

a bank of detectors, each detector coupled to one corresponding filter in the bank of filters, for detecting a filtered pulse and its corresponding background noise;

a bank of threshold devices, each threshold device coupled to one corresponding detector in the bank of detectors and having a power level threshold value corresponding to the bandwidth of one of the plurality of bands, for differentiating the detected signal pulse from its corresponding background noise; and

a summing circuit, coupled to the bank of threshold devices, for summing the differentiated signals to create a decoded output signal.

4,985,900

NON-INTRUSIVE CHANNEL-IMPAIRMENT ANALYZER

William G. Rhind, Linlithgow, and Norman G. Carder, Edinburgh, both of Scotland, assignors to Hewlett-Packard, Pinewood, England

Continuation of Ser. No. 408,472, Sep. 15, 1989, abandoned, which is a continuation of Ser. No. 292,665, Dec. 29, 1988, abandoned, which is a continuation of Ser. No. 177,802, Apr. 8, 1988, abandoned, which is a continuation of Ser. No. 3,665, Jan. 15, 1987, abandoned. This application Apr. 2, 1990, Ser. No. 503,092

Claims priority, application United Kingdom, Jan. 18, 1986, 8601210; Mar. 8, 1988, 8605576

Int. Cl.[5] H04B *3/46*; H03H *7/30*

U.S. Cl. 375—10 **10 Claims**

1. A non-intrusive channel-impairment measurement system for measuring at least one quasistatic impairment characteristic of a band-limited data communications channel, comprising:

a data receiver section for receiving over said channel, data modulated onto quadrature phases of a carrier signal, the receiver section being arranged to process the received signal in two quadrature forward processing paths and comprising:

(a) a data recovery circuit for providing signals (d_i, d_q) representing estimates of the received data based on output signals (z_i, z_q) from said forward processing paths;

(b) decision-directed compensation means disposed in said

forward processing paths and arranged to compensate for channel-impairment effects on the received signals; and

(c) error generation means for generating error signals indicative of the difference between the estimates (d_i, d_q) and the output signals (z_i, z_q) of the forward processing paths; and

a measurement section responsive to the error signals generated in the receiver section for deriving a measurement of signal jitter, said measurement section comprising:

(d) filter means for receiving the error signals and deriving jitter signals (J_{IN}(n)) therefrom, and providing said jitter signals to an adaptive line enhancer;

(e) the adaptive line enhancer being for isolating deterministic components of the jitter signals (J_{IN}(n) from background noise, the adaptive line enhancer comprising a fixed delay arranged to receive said jitter signals, a transversal filter fed from the fixed delay and having a response dependent upon a set of tap coefficients, a comparator for providing difference signals indicative of the difference between the jitter signals and output signals (J_{OUT}(n) generated by the transversal filter, and update means for adjusting the tap coefficients of the transversal filter such as to minimize the comparator difference signals; and

(f) means responsive to J_{out}(n) for providing signals indicative of signal jitter;

wherein J_{IN}(n) represents noise-corrupted jitter signals and J_{OUT}(n) represents deterministic components of J_{IN}(n).

4,985,901

METHOD AND DEVICE FOR EVALUATING THE SAFETY MARGIN OF A DIGITAL VIDEO SIGNAL

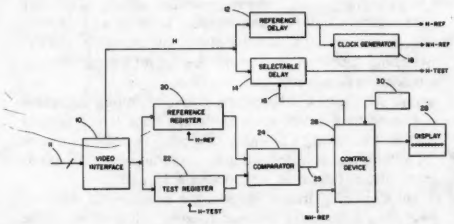
Hervé Cohen, Paris, and Jean-Marie Fouillet, Neuilly Plaisance, both of France, assignors to Telediffusion de France, Paris, France

Filed Jun. 21, 1989, Ser. No. 368,722

Claims priority, application France, Jun. 21, 1988, 88 08303

Int. Cl.[5] H04B *3/46*; H04N *12/00*

U.S. Cl. 375—10 **6 Claims**



3. A device for evaluating the safety margin offered by a video signal consisting of digital data circulating with a clock signal on a parallel digital video interface, comprising:

means for generating, from the original clock signal at the output of the interface, a reference clock signal having a fixed amount of time shift with respect to the original clock signal compensating for the time shift caused by the interface and a test clock signal having a selectable phase shift with respect to the reference clock signal;

two decoding registers receiving the data signal and having sampling inputs receiving respectively the reference clock signal and the test clock signal;

comparator means connected to the outputs of the two registers and arranged to deliver a signal responsive to a difference between said outputs; and

control means for progressively increasing the amount of selectable phase shift and displaying, for each phase shift, the presence or number of differences.

4,985,902

DECISION FEEDBACK EQUALIZER AND A METHOD OF OPERATING A DECISION FEEDBACK EQUALIZER

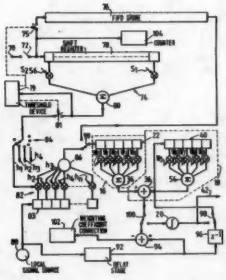
Mustafa K. Gurcan, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 4, 1989, Ser. No. 293,167

Claims priority, application United Kingdom, Jun. 2, 1988, 8813038

Int. Cl.[5] H03H *21/00*

U.S. Cl. 375—14 **13 Claims**



1. A decision feedback equalizer, said equalizer being for equalizing sequentially sampled data derived from the transmission of successive symbols via a dispersive signalling channel having an impulse response versus time delay such that an individual symbol produces a first and subsequent symbol samples, with a peak at a time delay corresponding to one of said first and subsequent symbol samples, said equalizer, comprising:

an input of said equalizer for sampled data received from said channel;

an output of said equalizer for equalized data samples;

a feedforward filter section having an input and an output;

first coupling means for coupling the sampled data from the input of said equalizer to the input of said feedforward filter as applied data;

a feedback filter section having an input and an output;

a decision stage having an input and an output;

second coupling means for coupling the outputs of said feedforward and feedback filter sections to the input of said decision stage; and

third coupling means for coupling the decision stage to the input of said feedback filter section and to the output of said equalizer;

wherein said feedforward filter section comprises successive storage locations for a current applied data sample and successively delayed applied data samples preceding the current applied data sample, taps aligned with said successive storage locations, and weighted sum means for applying weighting coefficients to said taps to form the output of the feedforward filter section; and

means for deriving said weighting coefficients to correspond

to a reference tap position of said feedforward filter section which is aligned with a said storage location for an applied data sample delayed with respect to the current applied data sample by the time delay to the peak of the impulse response when the peak occurs at the first symbol sample and which is aligned with a said storage location for an applied data sample delayed with respect to the current applied data sample by less than the time delay to the peak of the impulse response when the peak occurs at a symbol sample after the first symbol sample.

4,985,903

BUS COUPLING CIRCUIT

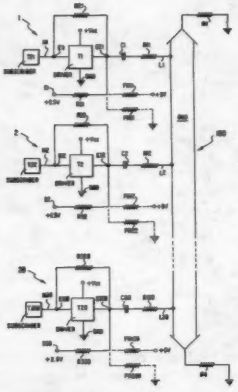
Johannes Heichler, Murrhardt, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Oct. 17, 1989, Ser. No. 422,516

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1988, 3835458; Feb. 20, 1989, 3905109

Int. Cl.[5] H04B *3/00*; H04L *25/00*

U.S. Cl. 375—36 **12 Claims**



1. In a bus coupling circuit for coupling data between a transmitting subscriber and a receiving subscriber by way of a data transfer bus, each subscriber including: a bidirectional driver for transmitting and receiving data, each bidirectional driver including means for reintroducing a direct voltage at a bus-side input/output port of each driver, and direct voltage splitting means constituting a working impedance for the driver and connected between the driver and the bus; each driver having a first input/output port which is remote from the bus and a second input/output port electrically connected to the bus, the improvement comprising:

a source of direct supply voltage;

a hysteresis circuit connected to each driver, said hysteresis circuit including a voltage divider which is responsive to alternating signals on the bus and which is disposed between the first input/output port of the driver and said source of direct supply voltage, said voltage divider having a divider tap disposed at the second driver input/output port to provide a direct supply voltage at the second input/output port of the driver;

said voltage divider having a first voltage divider resistor connected between the first and second driver input/output ports and a second voltage divider resistor connected between the second driver input/output port and said source of direct supply voltage, the first and second voltage divider resistors having respective resistance values R2x and R3x which satisfy the following relationship:

$$\frac{R3x}{R2x + R3x} = \frac{1}{1 + n}$$

where x is a variable representing the sequential number of the respective subscriber, and n is the number of tolerable driver short circuits; whereby the bus is fault tolerant for a plurality n of driver short circuits.

4,985,904

HIGH SPEED SWITCHING SYSTEM IN A RADIO-COMMUNICATION SYSTEM INCLUDING A PLURALITY OF MAIN COMMUNICATION SYSTEMS AND A PLURALITY OF STAND-BY COMMUNICATION SYSTEMS

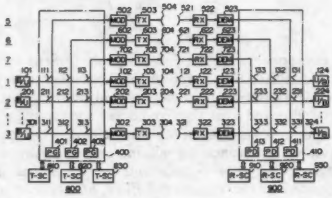
Akihiro Ogawara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 242,203, Sep. 9, 1988, abandoned. This application May 17, 1990, Ser. No. 524,714

Claims priority, application Japan, Sep. 10, 1987, 62-227011

Int. Cl.[5] H04B *7/02*

U.S. Cl. 375—38 **9 Claims**



1. A digital radio-communication system comprising:

a plurality of main radio-communication systems, each including a main data transmission circuit means provided at a first side, a main space data transmission line, and a main data reception circuit means provided at a second side and operatively connected to said main data transmission circuit means through said main space data transmission line;

a plurality of stand-by radio-communication systems provided for backing-up said main radio-communication systems, each including a stand-by data transmission circuit means provided at said first side, a stand-by data transmission line, and a stand-by data reception circuit means provided at said second side and operatively connected to said stand-by data transmission circuit means through said stand-by data transmission line;

a first switching circuit means provided among said main and stand-by radio-communication systems at said first side, and including a plurality of first switching circuits for switching between said main and stand-by radio-communication systems at said first side;

a second switching circuit means provided among said main and stand-by radio-communication systems at said second side, and including a plurality of second switching circuits for switching between said main and stand-by radio-communication systems at said second side; and

channel switching means including a plurality of pairs of switching means, the number thereof being equal to the number of said stand-by radio-communication systems, and said plurality of pairs of switching means being independently operable from one another, each pair of said switching means including a plurality of first switching means provided at said first side to activate said first switching circuits, and a plurality of second switching means provided at said second side to activate said second

switching circuits and cooperating with said plurality of first switching means,

each of said second switching means monitoring statuses of a plurality of said main radio-communication systems, and sending a switching command to said corresponding first switching means when a failure in a main radio-communication system is detected,

said corresponding first switching means activating a first switching circuit in said first switching circuit means to transmit transmission data, which are equivalent to those data transmitted through the failed main radio-communication system, through a stand-by radio-communication system which is defined in connection with said first and second switching means, in response to said switching command sent from said second switching means, and

said second switching means activating a second switching circuit in said switching circuit means to receive said data transmitted through said stand-by radio-communication system, at said second side, in response to said switching at said corresponding first switching means,

wherein said second switching means monitors only said failed main radio-communication system backed-up by said stand-by radio-communication system to detect a restoration of said failed main radio-communication system, and restores said failed main radio-communication system to a normal mode in which it is not backed-up by said stand-by radio-communication system when said failed main radio-communication system is returned to a normal state,

wherein said plurality of main radio-communication systems is divided into a plurality of monitoring groups, the number thereof being equal to the number of the second switching means,

wherein each of said second switching means monitors a plurality of main radio-communication systems in a corresponding monitoring group in a normal condition,

wherein, when at least one of said second switching means detects a failed main radio-communication system and monitors said failed main radio-communication system to restore said failed main radio-communication system when returned to normal, the other second switching means monitors said main radio-communication systems in a corresponding monitoring group, and further, monitors said main radio-communication systems in the monitoring group monitored by said failure detecting second switching means in the normal condition, except for said failed main radio-communication system and carries out back-up operation by using stand-by radio-communication systems defined by said other second switching means together with the corresponding first switching means when detecting a failure in said further monitoring main radio-communication systems.

4,985,905

TWO PHASE CMOS SHIFT REGISTER BIT FOR OPTIMUM POWER DISSIPATION

James J. Kubinec, Incline Village, Nev., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 251,725, Sep. 30, 1988, abandoned. This application May 7, 1990, Ser. No. 521,007

Int. Cl.[5] H03K *23/44, 3/286;* G11C *11/412*

U.S. Cl. 377—79 **3 Claims**

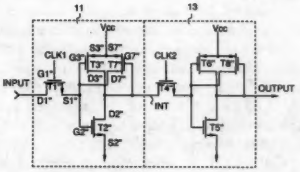
1. A two-phase shift register bit apparatus having an input terminal for receiving bits of data, an output terminal for providing bits of data, power supply and ground terminals, comprising:

first transfer means consisting of a single first MOS transistor having gate, first and second terminals, means coupling said first terminal of said first MOS transistor to said input terminal of said apparatus for receiving a first data bit in one of first and second mutually exclusive states, said gate terminal of said first MOS transistor being connected to receive a first clock signal, said first data bit being transferred to said second terminal when said first clock signal is received;

first inverter having input and output terminals, said input terminal of said first inverter being connected only to said second terminal of said first MOS transistor, said input terminal of said first inverter being a dynamic storage node with respect to at least one state of said first data bit;

first voltage pull means connected between said input and output terminals of said first inverter for providing a first pulled voltage at said second terminal of said first MOS transistor, said first voltage pull means consisting of a single third transistor having one of first and second mutually exclusive structures in accordance with whether said first MOS transistor is of the n-channel type or p-channel type, such that, in said first structure of said first voltage pull means, when said first data bit being in said first state, said first pulled voltage at said first inverter input terminal substantially equals the voltage at said power supply terminal, and such that, in said second structure of said first voltage pull means, when said first data bit being in said second state, said first pulled voltage at said first inverter input terminal substantially equals the voltage at said ground terminal;

second transfer means consisting of a single second MOS transistor having gate, first and second terminals with the first terminal connected only to said output terminal of said first inverter for receiving from said output terminal of said first inverter a second data bit also in one of said



first and second mutually exclusive states, said gate terminal of said second MOS transistor being connected to receive a second clock signal later in time than said first clock signal, said second data bit being received when said second clock signal is received;

second inverter having input and output terminals, said input terminal of said second inverter being connected only to said second terminal of said second MOS transistor, said input terminal of said second inverter being a dynamic storage node with respect to at least one state of said second data bit; and

second voltage pull means connected between said input and output terminals of said second inverter for providing a second pulled voltage at said second terminal of said second MOS transistor, said second voltage pull means consisting of a single fourth transistor also having one of said first and second mutually exclusive structures in accordance with whether said second MOS transistor is of the n-channel type or p-channel type, such that, in said first structure of said second voltage pull means, when said second data bit being in said first state, said second pulled voltage at said second inverter input terminal substantially equals the voltage at said power supply terminal, and such that, in said second structure of said second voltage pull means, when said second data bit being in said second state, said second pulled voltage at said second inverter input terminal substantially equals the voltage at said ground terminal.

4,985,906

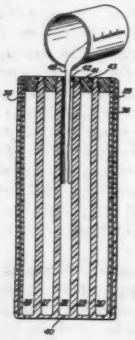
CALIBRATION PHANTOM FOR COMPUTER TOMOGRAPHY SYSTEM

Ben A. Arnold, 4 Sandstone, Irvine, Calif. 92714

Continuation of Ser. No. 298,789, Jan. 18, 1989, abandoned, which is a continuation of Ser. No. 15,047, Feb. 17, 1987, abandoned. This application Oct. 2, 1989, Ser. No. 418,778

Int. Cl.[5] G01N *23/00*

U.S. Cl. 378—18 4 Claims



1. A calibration phantom for a quantitative computerized tomography (QCT) system of bone mineral measurement in which a series of graduated reference samples having x-ray attenuation characteristics closely proximate to human tissue are retained within cavities integral with the material forming the phantom base and wherein said cavities are located closely proximate the upper and lower surfaces of said phantom so as to reduce the size and mass of the phantom and thus reduce x-ray base hardening, scatter and image artifacts, comprising:

a base formed of a material having x-ray attenuation properties with a CT number closely approximate to human tissue;

a plurality of elongated cavities formed in said base, so that the upper and lower surfaces of said base are closely proximate said cavities with a thickness of less than one cm of base material between the upper surface and lower surface of said base and said cavities;

a series of graduated concentrations of reference samples having x-ray attenuation characteristics corresponding to human bone retained within said cavities such that the samples are indirect contact with the base material; and

a closure which seals the cavity to encapsulate the samples within said cavity.

4,985,907

DENTAL X-RAY APPARATUS FOR PANORAMIC TOMOGRAPHY

Roberto Moteni, Milan, Italy, assignor to U.S. Philips Corporation, New York, N.Y.

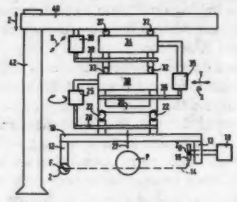
Filed May 3, 1989, Ser. No. 347,315

Claims priority, application European Pat. Off., May 6, 1988, 88200900.4

Int. Cl.[5] A61B *6/02, 6/14*

U.S. Cl. 378—139 12 Claims

1. X-ray apparatus for panoramic tomography of an object to be examined comprising an X-ray source and X-ray detection means and a moving mechanism for translation and rotation of the X-ray source and of the X-ray detection means with respect to the object to be examined, characterized in that the moving mechanism is controlled by data momentally supplied from a microcomputer for two separate, independent directions of translation movement in a plane and for separate, independent rotation movement about an axis perpendicular to that plane whereby each said movement is made independently of the other movements, said moving mechanism being arranged so that said rotation movement axis is displaceable in said two individual directions.



4,985,908

DIGITAL FLUOROGRAPHY APPARATUS

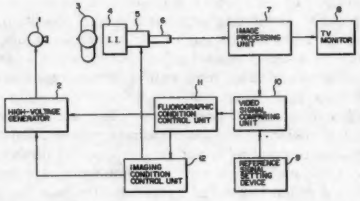
Hiroshi Asahina, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 327,391, Mar. 21, 1989, abandoned, which is a continuation of Ser. No. 199,871, May 27, 1988, abandoned, which is a continuation of Ser. No. 872,835, Jun. 12, 1986, abandoned. This application Nov. 30, 1989, Ser. No. 443,858

Claims priority, application Japan, Jun. 15, 1985, 60-130466

Int. Cl.[5] H05G *1/64*

U.S. Cl. 378—99 9 Claims



1. A digital fluorography apparatus for imaging an object, said apparatus comprising:

X-ray generation means including an X-ray tube for illuminating the object with X-rays in accordance with a voltage and a current applied to said X-ray tube, and X-ray control means for controlling said voltage and current to said X-ray tube;

X-ray/photo converting means spaced from said X-ray tube to sandwich the object between said X-ray tube and said X-ray/photo converting means for converting said X-rays into light corresponding to an optical image of the object;

imaging means operatively coupled to said X-ray/photo converting means for converting said light into a video signal, said imaging means including light amount adjusting means for adjusting the amount of said light received by said imaging means;

image processing means operatively coupled to said imaging means for processing said video signal, said image processing means having a fluorography mode in which said image processing means directly outputs said video signal, and an imaging mode in which said image processing means selectively processes said video signal to produce a processed video signal and outputs said processed video signal;

display means operatively coupled to said image processing means for displaying an image of the object in response to said processed video signal;

comparing means operatively coupled to said image processing means for comparing said video signal in the fluorography mode with a reference signal and for generating a difference signal corresponding to the difference of said video signal and said reference signal;

fluorographic control means operatively coupled to said comparing means and to said X-ray control means for generating a first control signal corresponding to said difference signal and providing said first control signal to said X-ray control means to control said X-ray tube voltage during said fluorographic mode; and

imaging control means operatively coupled to said fluorographic control means, to said X-ray control means, and to said light amount adjusting means, for prestoring a plurality of voltage relationships between an object thickness and an imaging voltage for said X-ray tube, each of the voltage relationships corresponding to a unique setting for said light amount adjusting means, and for selecting a value of a second control signal from one of said voltage relationships in accordance with said first control signal and communicating said second control to said X-ray control means to control said voltage of said X-ray tube and to said light amount adjusting means to control said light amount adjusting means during said imaging mode.

4,985,909

EXPOSURE UNIT FOR A FILM CHANGER

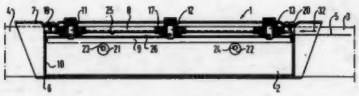
Erik Bjoerk, Stockholm, and Ola Wiklund, Jaerfaella, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 275,365

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1987, 3740169

Int. Cl.[5] G03B *42/04*

U.S. Cl. 378—173 **10 Claims**



1. An exposure unit in a film changer, comprising:

an upper platen and a lower platen being movable in height relative to one another so that film is introducible between said upper and lower platens in one position and so that said upper and lower platens press against the film in another position;

first fastening means for fastening said lower platen; and

second fastening means for fastening said upper platen, at least said second fastening means being resilient with sufficient flexibility that said upper platen is aligned parallel to said lower platen when said upper and lower platens are pressed against the film.

4,985,910

METHOD AND APPARATUS FOR RETROFITTING A STANDARD COIN OPERATED TELEPHONE EMPLOYING A CARBON MICROPHONE WITH A LINE POWERED ELECTRONIC CONTROLLER

Patrick J. McGarry, West Chester, Pa., assignor to Mars Incorporated, McLean, Va.

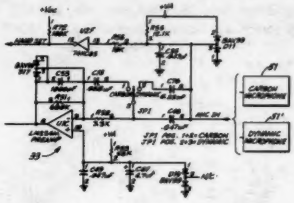
Filed Sep. 15, 1989, Ser. No. 407,896

Int. Cl.[5] H04M *17/02*

U.S. Cl. 379—27 **23 Claims**

3. An improved low power, coin operated telephone control circuit comprising:

a carbon microphone input circuit for connection to a carbon microphone output signal, said input circuit adding an appropriate bias level to the carbon microphone output signal and producing a biased output signal, the appropriate bias level being significantly less than 5 mA; and



an amplifier circuit having an input connected to receive the biased output signal, said amplifier amplifying the input and producing an amplified output signal.

4,985,911

CONVERSATIONAL VIDEO PHONE

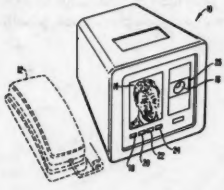
Lawrence D. Emmons; James S. Mackley, both of Grass Valley; David H. Stokes, Nevada City; Rudolph S. Stefenel; William E. Brisko, Jr., both of San Jose, and Michael A. Cooper-Hart, Cupertino, all of Calif., assignors to Mitsubishi Electronics America, Inc., Cypress, Calif.

Division of Ser. No. 92,346, Sep. 2, 1987, Pat. No. 4,932,047, which is a continuation-in-part of Ser. No. 795,967, Nov. 7, 1985, Pat. No. 4,715,059. This application Mar. 27, 1989, Ser. No. 331,006

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.[5] H04M *11/00*; H04N *7/14*

U.S. Cl. 379—53 **6 Claims**



1. A method for transmitting a single frame of a video image and audio signals over an ordinary telephone line comprising the steps of:

asynchronously transmitting protocol data, said protocol data including

hardware preamble data for use by a remote video phone to synchronize a clock at said remote video phone with said protocol data,

software preamble data for identifying the following data as representing a video image,

automatic gain control adjustment data, and

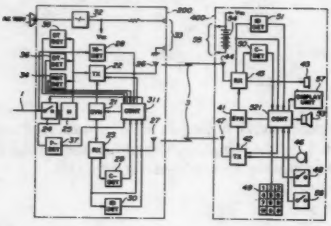
amplitude calibration data for correlating each received amplitude modulation level to a corresponding assigned amplitude modulation level; and

asynchronously transmitting over said telephone line a modulated signal representing said video image in a burst.

4,985,912
RADIO TELEPHONE DEVICE

Koji Ono, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 28, 1988, Ser. No. 250,451
Claims priority, application Japan, Sep. 30, 1987, 62-246792
Int. Cl.[5] H04Q 7/04
U.S. Cl. 379—61 12 Claims



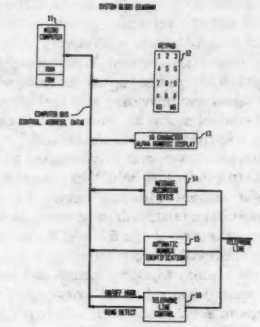
8. A radio telephone device comprising:
a base unit connected to a wire circuit;
a radio telephone set connected to said base unit via a radio circuit;
on-hook designation means provided in said radio telephone set for designating an on-hook dialing and transmission operation;
tone-signal detection means provided in said base unit for detecting a tone signal transmitted from said wire circuit;
polarity-inversion detection means provided in the base unit for detecting a polarity inversion of a signal on the wire circuit;
judging means for judging a state of said wire circuit on the basis of said detection output of said tone-signal detection means and said detection output of said polarity-inversion detection means and said judging means obtaining a judgment result upon said designation of an on-hook dialing and transmission operation;
transmission means for transmitting said judgment result via said radio circuit to said radio telephone set; and
display means provided in said radio telephone set for visually displaying said judgment result of said judging means.

4,985,913
MULTIPLE MESSAGE ANSWERING MACHINE KEYED TO THE INCOMING PHONE NUMBER

Stephen R. Shalom, 135 Haddon Pl., Montclair, N.J. 07043, and David A. Cane, Sudbery, Mass., assignors to Stephen R. Shalom, Montclair, N.J.

Filed Aug. 29, 1989, Ser. No. 399,984
Int. Cl.[5] H04M 1/64
U.S. Cl. 379—76 22 Claims

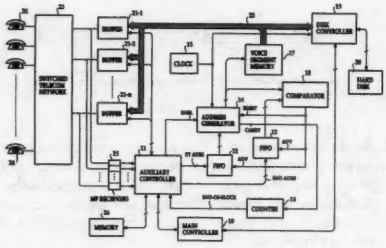
1. A telephone answering machine comprising:
means for storing a plurality of messages;
means for establishing a correspondence between a plurality of telephone numbers and said plurality of messages;
automatic number identification means for identifying a caller's telephone number; and
selecting means responsive to said automatic number identification means and said means for establishing a correspondence for selecting one of said plurality of messages for playback.



4,985,914
VOICE STORAGE/RETRIEVAL SYSTEM WITH MEMORY ADDRESS GENERATOR SUCCESSIVELY INITIALIZED WITH START-POINT ADDRESSES

Masayuki Fukunaga, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 12, 1990, Ser. No. 464,327
Claims priority, application Japan, Jan. 13, 1989, 1-4911
Int. Cl.[5] H04M 3/50
U.S. Cl. 379—88 4 Claims



1. A voice storage and retrieval system comprising:
a buffer memory connectable to a subscriber station;
a voice segment memory for storing a plurality of voice segments;
a first first-in-first-out (FIFO) memory having a plurality of successive storage locations;
a second FIFO memory having a plurality of successive storage locations;
control means responsive to request from said subscriber station for generating a series of start-point addresses respectively signifying beginnings of particular voice segments to be sequentially read out of said voice segment memory and a series of end-point addresses respectively signifying ends of said particular voice segments and for sequentially storing said start-point addresses into the successive storage locations of said first FIFO memory and sequentially supplying said end-point addresses into the successive storage locations of said second FIFO memory;
address generator means for incrementing a count value beginning with an initial value which is set equal to an output of said first FIFO memory and supplying the incre-

mented count value to said voice segment memory to sequentially read said particular voice segments out of said voice segment memory into said buffer memory; and

comparator means for detecting a coincidence between said incremented count value and an output of said second FIFO memory, and cusing each of said first a second FIFO memories to advance their stored addresses by one storage location so that a subsequent start-point address and a subsequent end-point address respectively appear at the outputs of said first and second FIFO memories when said coincidence is detected.

4,985,915
METHOD FOR INTERFACING BETWEEN A KEY-PHONE SYSTEM AND A KEY-PHONE SUBSCRIBER

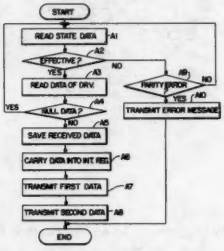
Jung-Sup Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyung Ki-Do, Rep. of Korea

Filed Jun. 27, 1989, Ser. No. 371,823

Claims priority, application Rep. of Korea, Jun. 27, 1988, 1988-7801

Int. Cl.[5] H04M *1/00*

U.S. Cl. 379—165 **20 Claims**



1. A method for interfacing between a key-phone system and a key-phone subscriber, said key-phone system having a first and a second data interfacing section for executing a data interfacing operation, wherein said method comprises:

a first step for reading data state for received data from data receiver means, checking whether said received data is effective, and generating a parity error if the received data is not effective;

a second step for reading the received data from said data receiver means when the received data in said first step is effective, and thereafter returning to said first step if the data read from said data receiver is null data;

a third step for processing the data read when the data read is not null data in said second step and sequentially outputting first and second processed data to data transmitter means, and thereby ending the process; and

a fourth step for providing an error message to a key-phone when a parity error is generated in said first step and, then, ending the process.

4,985,916
PARTY LINE CONVERTER

Leo Tachuk, and Michael K. Tulley, both of Alberta, Canada, assignors to Trison Telecommunications Ltd., Alberta, Canada

Filed Nov. 1, 1989, Ser. No. 430,126

Int. Cl.[5] H04M *1/70, 13/00*

U.S. Cl. 379—178 **11 Claims**

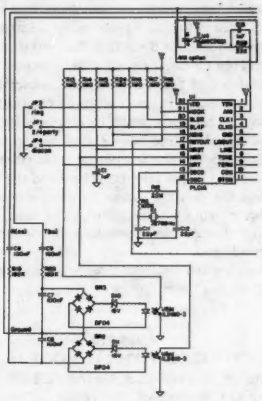
1. A telephone subscriber interface device for connecting a subscriber station to a telephone line, the interface device comprising:

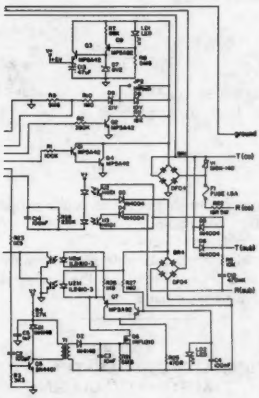
a line detector connected to the telephone line for generating a line-busy signal in response to the telephone being busy and a line-free signal in response to the telephone line being free;

a hook detector connected to the subscriber station for generating an on-hook signal in response to the subscriber station being on-hook and an off-hook signal in response to the subscriber station being off-hook;

a ring detector connected to the telephone line for generating a ring signal in response to the presence of ring signals on the telephone line and a no-ring signal in response to the absence of ring signals on the telephone line;

control means connected to the line detector, the hook detector and the ring detector, the control means having a





ready state in which the control means has no active outputs and a primary connect state accessible from the ready state in response to receiving a line-free signal, an off-hook signal, and a no-ring signal for a pre-determined period of time;

the control means including means for generating a connect signal when the control means is in the connect state;

connect means connected to the control means for connecting the subscriber station to the telephone line in response to the connect signal;

the control means having a monitor state accessible from the primary connect state in response to receiving a line free signal and a pre-determined signal from the subscriber

station, the primary connect state being accessible from the monitor state in response to receiving a line busy signal, an off-hook signal, and a no-ring signal;

the subscriber station being disconnected from the telephone line when the control means is in the monitor state;

a ring indicator connected to the telephone line for generating a signal in response to the presence of ring signals on the telephone line from a called subscriber;

reset means for resetting the control means to the ready state in response to receiving an on-hook signal from the hook detector, a line-free signal from the line detector and a no-ring signal from the ring detector;

the control means having an any-ring state in response to the detection of ring signals on the telephone line;

the control means including decoding means connected to the telephone line for decoding the ring signal, the control means having an our-ring state in response to decoding a ring signal coded for the telephone subscriber;

the control means having an incoming connect state accessible from the our-ring state in response to receiving an off-hook signal, a line-busy signal and a ring signal decoded as being for the telephone subscriber;

means connected to the telephone line and the control means for setting the control means to detect a single burst between tip or ring conductors of the telephone line and ground or double burst between tip or ring conductors and ground; and

the decoding means including means for detecting a single burst or double burst.

4,985,917

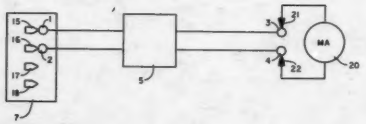
PERSONAL ARTIFICIAL LOOP (P.A.L.)

David F. Altimier, Jr., and B. J. McIntosh, both of A&M Technology Box 818, Waterford, Pa. 16441

Filed Aug. 17, 1989, Ser. No. 394,817

Int. Cl.[5] H04M *3/24*

U.S. Cl. 379—32 **7 Claims**



1. Apparatus for testing at a source for proper activation of a line amplifier, comprising:

a balanced resistance network,

said network having a double set of connectors for series adding said network between the line amplifier and other equipment or wire pairs.

4,985,918

AUTOMATIC DIALING APPARATUS AND METHOD OF AUTOMATIC DIALING

Shigeki Tanaka, and Hiroki Satoo, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 21, 1989, Ser. No. 382,489

Claims priority, application Japan, Jul. 26, 1988, 63-187773

Int. Cl.[5] H04M *1/00*

U.S. Cl. 379—356 **12 Claims**

1. An automatic dialing apparatus for converting one of a plurality of telephone numbers, each including plural sets of digits, one set corresponding to each of an area code, local code, and subscriber code, respectively, to a corresponding tone signal and outputting the same, comprising:

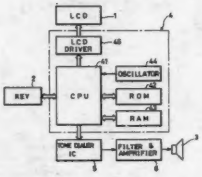
storage means for sequentially storing said plurality of telephone numbers, each including at least one common set of digits, said at least one common set of digits stored once with separating information and at least one uncommon set of digits for each of said plurality of telephone numbers, said separating information separating the plurality of at least one uncommon set of digits for said plurality of at least one uncommon set of digits for said plurality of telephone numbers from each other;

search instructing means for instructing searching of the plurality of telephone numbers for a telephone number to be output;

cancel instructing means for instructing sequential cancellation of conversion of said sequentially stored plurality of telephone numbers to a tone signal;

display means for sequentially displaying the plurality of telephone numbers, displaying said at least one uncommon set of digits with said separating information separating each of said plurality of telephone numbers stored in said storage means;

tone signal converting means for converting and subsequently outputting one of a plurality of said telephone numbers to a tone signal; and



control means responsive to an instruction from said search instructing means for reading and subsequently displaying on the display means, the plurality of telephone numbers, with the separating information, from said storage means, and further, responsive to sequential instructions from said cancel instructing means, for sequentially searching the separating information for separating said plurality of read telephone numbers, and for sequentially shifting and finally setting a discriminating mark to replace each sequential separating information in a search place, in response to each said cancellation instruction and thus cancelling tone signal generation corresponding to telephone numbers previously sequentially stored before said separating information replaced by the set discriminating mark, and subsequently generating a tone signal, corresponding to a telephone number previously sequentially stored after said separating information replaced by the set discriminating mark, by said tone signal converting means.

4,985,919

SECURE COMMUNICATION CONTROL SYSTEM

Yoshihiro Naruse; Hideharu Kato, both of Chiba, and Yoshifumi Iwata, Aichi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 27, 1989, Ser. No. 413,556

Claims priority, application Japan, Sep. 30, 1988, 63-246055

Int. Cl.[5] H04N *7/167*; H04M *11/00*

U.S. Cl. 380—18 **5 Claims**

1. In a communication system comprising a local device and a far-end device which communicate with each other, a secure communication control system comprising:

a first plurality of signal wires connected to the far-end device;

a first modem, having modulation input terminals and connected to said first plurality of signal wires, for demodulating a signal coming over said first plurality of signal wires,

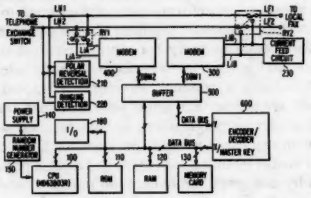
and for modulating a signal supplied to its modulator input terminals and delivering the modulated signal to said first plurality of signal wires;

a second plurality of signal wires connected to said local device;

a third plurality of signal wires;

a second modem, having modulator input terminals and connected to said third plurality of signal wires, for demodulating a signal coming over said third plurality of signal wires and for modulating a signal supplied to its modulator input terminals and delivering the modulated signal to said third plurality of signal wires;

secure information processing means for decoding the signal demodulated by said first modem and supplying the decoded signal to the modulator input terminals of said second modem, and for encoding the signal demodulated



by said second modem and supplying the encoded signal to the modulator input terminals of said first modem;

switching means for selectively connecting said second plurality of signal wires to one of said first plurality of signal wires or said third plurality of signal wires; and

electronic control means for controlling said switching means, said first modem and said second modem to intervene between said local and said far-end devices, for channelling encoded incoming information over said first plurality of signal wires to said secure information processing means which in turn decodes and delivers decoded outgoing information to said second plurality of signal wires, and for channelling information transmitted from said second plurality of signal wires through said secure information processing means to encode and deliver encoded outgoing information to said first set of signal wires.

4,985,920

INTEGRATED CIRCUIT CARD

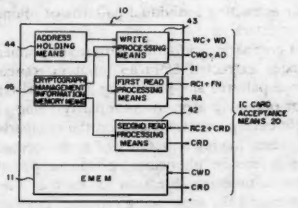
Junji Seki, Ebina, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 21, 1989, Ser. No. 313,184

Claims priority, application Japan, Feb. 20, 1988, 63-038078; Jun. 22, 1988, 63-154014

Int. Cl.[5] G06K *19/00*; H04L *9/06*

U.S. Cl. 380—23 **26 Claims**



1. An IC card comprising:

a processor contained therein and communicating with an external IC card acceptance means;

an internal memory contained in the IC card, cooperating with the processor and forming data files;

an external memory mounted on a surface of a body of the IC card, said internal memory including:

first files allotted to said external memory;

second files allotted to said internal memory; and

a first directory for defining said first files allotted to said external memory; and

an external memory access means, other than an internal memory access means, formed by said processor, said external memory access means alone can access said external memory by way of said external IC card acceptance means, said external memory access means established by a program and said internal memory access means established by a program, both programs being stored in a program ROM provided by said processor in the IC card.

4,985,921

PORTABLE DATA CARRYING DEVICE

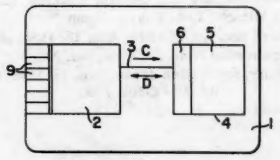
Hermann Schwartz, Pfäffikon, Switzerland, assignor to SPA Sypatronic AG, Zug, Switzerland

Filed Apr. 5, 1989, Ser. No. 333,646

Claims priority, application Switzerland, Apr. 11, 1988, 01323/88

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—24 **7 Claims**



1. A portable data carrying device comprising a control unit and an additional data memory which are each implemented as integrated circuits, wherein the control unit is provided with means for placing it in communication with an external read/-write device characterized in that entry into the additional data memory (5) by the control unit (2) is protected by coding means which is in the carrying device and is operative to permit entry into the additional data memory (5) without participation of system parts external to the carrying device.

4,985,922

SIGNAL AND POWER TRANSMISSION THROUGH A WALL

Melvin Kolbert, Boca Raton, Fla., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jul. 27, 1988, Ser. No. 224,605

Int. Cl.[5] H04B *5/00*

U.S. Cl. 380—59 **1 Claim**

1. An inductive coupling for transferring a signal across a thin conductive wall, the coupling comprising:

a sending unit having

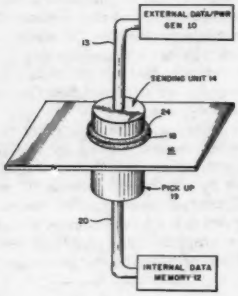
(a) a housing made of ferromagnetic material;

(b) a central core about which is wrapped a coil which receives the signal from a source; and

(c) a ring magnet secured to the sending unit housing and extending outwardly therefrom for permitting detachable mounting to the wall; and further wherein the coupling includes a pick-up unit having

(a) a housing made of ferromagnetic material and located entirely within the wall interior and in contact therewith, in alignment with the sending unit;

(b) a central core about which is wrapped a coil which receives the couple signal for distribution to a utilization device;



the wall having an opening with projections therearound, the opening filled with non-conductive material,

wherein the coupling exists across the filled opening for decreasing coupling power dissipation.

4,985,923

HIGH EFFICIENCY VOICE CODING SYSTEM

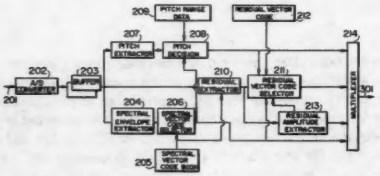
Akira Ichikawa, Musashino; Yoshiaki Asakawa, Kawasaki; Akio Komatsu, Kodaira, and Eiji Oohira, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 895,916, Aug. 13, 1986, abandoned. This application Mar. 27, 1989, Ser. No. 328,702

Claims priority, application Japan, Sep. 13, 1985, 60-201542

Int. Cl.[5] G10L *7/02*

U.S. Cl. 381—38 **6 Claims**



4. A speech coding system for transmitting speech using a small amount of information comprising:

means for inputting speech and transforming said speech into a digitized speech signal;

vector quantization means for extracting spectrum envelope information from said digitized speech signal, matching said extracted spectrum envelope information with spectrum envelope information prestored in a spectrum vector code memory said spectrum envelope information prestored in said spectrum vector code memory corresponds to respective spectrum vector codes and outputting a spectrum vector code corresponding to spectrum envelope information in said spectrum vector code memory which has the highest resemblance to said extracted spectrum envelope information based on said matching;

means for extracting speech source information from said digitized speech signal;

speech source information coding means for selecting candidate speech source information from speech source information prestored in a memory, said selected speech source information corresponding to said spectrum vector code output by said vector quantization means, matching said extracted speech source information with said selected speech source information and outputting a speech source vector code corresponding to speech source information of said selected speech source information having the highest resemblance to said extracted speech source information; and

means for transmitting said spectrum vector code provided by said vector quantization means and said speech source vector code provided by said speech source information coding means;

wherein said speech source information coding means comprises a pitch extractor for extracting a pitch signal from said digitized speech signal, a pitch means specifying data memory for storing ranges of pitch data, and a pitch range decision unit which selects a pitch period, within a range specified by said pitch range specifying data memory, from an output of said pitch extractor based on said spectrum vector code output of said vector quantization means; and

wherein said speech source information coding means comprises a residual waveform extractor for extracting a residual waveform from said digitized speech signal, a residual waveform code memory for storing residual waveform vectors, and a residual waveform vector code selector which collates a residual waveform extracted by said residual waveform extractor with residual waveforms within a certain range stored in said residual waveform code memory based on said spectrum vector code output of said vector quantization means and a pitch period determined by said pitch range decision unit and wherein said residual waveform vector code selector selects a residual waveform with a highest resemblance to said extracted residual waveform.

4,985,924

SPEECH RECOGNITION APPARATUS

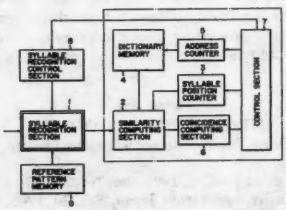
Hiroshi Matsuura, Odawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 287,329, Dec. 21, 1988, abandoned. This application Dec. 21, 1989, Ser. No. 453,269

Claims priority, application Japan, Dec. 24, 1987, 62-325368

Int. Cl.[5] G10L *7/08*

U.S. Cl. 381—43 **2 Claims**



1. A speech recognition apparatus comprising:

means for storing reference patterns corresponding to reference phonemes, respectively;

means for extracting individual patterns of phonemes from an input utterance;

means for comparing individual patterns of phonemes which have been extracted from an input utterance with the reference patterns and producing a comparison result;

means for obtaining a positive similarity value j of at least one reference phonemes based on the comparison result;

memory means having a plurality of areas corresponding to all the reference phonemes, phoneme positions being assigned in time-axis direction for each of the reference phonemes and the areas being provided corresponding to the respective phoneme positions and storing the similarity values;

means for storing in the area defined by the reference pho-

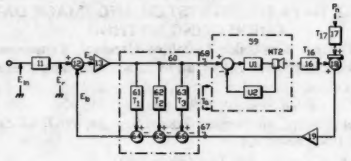
neme and the phoneme position, the similarity value j obtained by said similarity value obtaining means;
means for obtaining subsidiary similarity values having smaller values than the similarity value j;
means for temporarily storing the subsidiary similarity values in areas defined by immediately before and after the phoneme position of the same reference phoneme;
means for preliminarily storing words to be recognized;
means for extracting the similarity value j from said similarity value storing means and the subsidiary similarity values from said similarity value temporary storing means in accordance with the individual phonemes of a word from said word storing means;
means for accumulating the extracted similarity values from said similarity extracting means; and
means for recognizing the word based on the accumulated result from said accumulating means.

4,985,925

ACTIVE NOISE REDUCTION SYSTEM

Edwin Langberg, Medford, and F. Gerald Caruso, Palmyra, both of N.J., assignors to Sensor Electronics, Inc., Mt. Laurel, N.J.

Filed Jun. 24, 1988, Ser. No. 210,791
Int. Cl.[5] A61F *11/02*
U.S. Cl. 381—72 **18 Claims**



1. An earplug for placement in an ear canal with communication capability provided by a speaker, comprising:
a speaker for converting an electrical signal into an acoustical output;
a summing microphone;
an external active noise reduction circuit;
a cable connecting the speaker and the summing microphone to said external active noise reduction circuit;
an enclosure for supporting said speaker, said summing microphone, and said cable;
a hollow earplug adapter, the enclosure being mounted inside of said hollow earplug adapter, the enclosure and said earplug adapter having openings allowing close acoustical coupling among the speaker, the summing microphone, and the ear canal; and
said hollow earplug adapter forming an acoustical seal between the enclosure, a concha fossa and/or an ear canal wall, thereby acoustically isolating a small volume of the ear canal from ambient noise providing a quiet zone for active noise reduction.

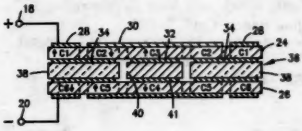
4,985,926

HIGH IMPEDANCE PIEZOELECTRIC TRANSDUCER

Richard G. Foster, Albuquerque, N. Mex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 29, 1988, Ser. No. 161,877
Int. Cl.[5] H04R *17/00*
U.S. Cl. 381—77 **15 Claims**

1. A transducer comprising:
a first piezoelectric element having first and second major surfaces;
a second piezoelectric element having third and fourth major surfaces;
means for forming at least two piezoelectric members having capacitance characteristics on each of said first and second piezoelectric elements so that all of said members on each of said elements are electrically in series; and



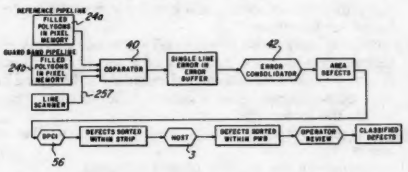
means for connecting one of said members on said first element to one of said members on said second element to form an equivalent series electrical circuit, said members oriented to maximize physical deflection of said elements.

4,985,927

METHOD OF DETECTING AND REVIEWING PATTERN DEFECTS

David A. Norwood, Richardson; William G. Manns, and Anthony B. Wood, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 25, 1988, Ser. No. 173,706
Int. Cl.[5] G06K *9/00*; H04N *7/18*
U.S. Cl. 382—8 **5 Claims**



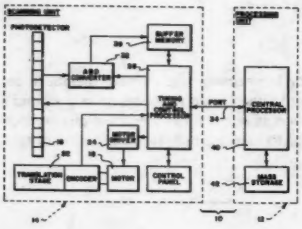
1. A computerized method of pattern defect review, comprising the steps of:
providing a database representation of an ideal pattern, the ideal pattern being comprised of one or more polygons defining the ideal pattern, and each polygon defining an ideal pattern is contained in a frame of data;
scanning a target with a laser, the reflected light from the target producing optical data representative of the pattern on the target;
inputting the optically generated data representing the pattern on a target;
generating a bit-mapped data representation of the ideal pattern, from the database representation with only those frames of data corresponding to the scanned area on the target;
comparing the bit-mapped data representation of the ideal pattern with the optically generated data representing the pattern on the target to identify and generate data representative of selected defect areas;
storing data identifying the locations of selected, defect areas wherein miscompares between the reference data and optically generated data occurred;
generating a bit-mapped data representation of a selected defect area, the bits in the bit-mapped area corresponding to pixels of the selected defect area; and selecting every Nth bit, where N is from the set (2, 4, 6 or 8), to de-zoom that portion of the database representation which corresponds to the selected defect area.

4,985,928

SIGNATURE FORGERY DETECTION DEVICE

Robert K. Campbell, 12502 Strathmore Rd., Garden Grove, Calif. 92640; John F. Cerlanek, Jr., 1423 Lambda Pl., Anaheim, Calif. 92805, and Kurt E. Schwalbe, P.O. Box 5847, Huntington Beach, Calif. 92615

Filed May 10, 1989, Ser. No. 349,861
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—3 4 Claims



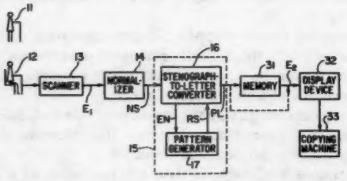
1. A method for analyzing an inscribed specimen comprising the steps of:
(a) collecting measurements of the optical density of a plurality of elements in the specimen across the grey scale;
(b) selectively retaining a plurality of the density measurements;
(c) processing the retained measurements by comparing each density measurement to a threshold value;
(d) conditionally retaining each density measurement with reference to the threshold value;
(e) forming a bounded locus of density measurements spatially distributed about each density measurement to be tested for retention;
(f) retaining only those conditionally retained density measurements which are members of a set of conditionally retained density measurements including at least one density measurement of an element conditionally retained within the locus;
(g) assigning retained density measurements to line segments;
(h) determining the location of said segments;
(i) forming vectors by combining measurements of said measurements within each line segment; and
(j) comparing the vectors to the vectors of a stored representation of a reference segment.

4,985,929

SYSTEM FOR USE IN PROCESSING A SPEECH BY THE USE OF STENOGRAPHS

Chizuko Tsuyama, 1-21-17, Asagaya-minami, Suginami-ku, Tokyo, Japan

Continuation of Ser. No. 651,281, Sep. 17, 1984, abandoned. This application Jul. 6, 1988, Ser. No. 218,475
Int. Cl.[5] G06K 9/20
U.S. Cl. 382—48 6 Claims



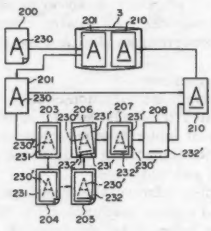
1. A speech processing system comprising stenograph signal producing means for producing a sequence of stenograph signals representative of a sequence of stenographs, respectively, and processing means coupled to said stenograph signal producing means for processing said stenograph signal sequence into an output signal, said stenograph signal producing means comprising:
a stationary support with a writing zone and an extension zone being defined relative thereto;
a recording medium;
drive means for transporting said recording medium relative to said support along a transport direction in sequence through said writing zone and said extension zone, whereby said stenograph sequence is manually written on said recording medium at said writing zone;
a movable support;
guide means for enabling movement of said movable support over and adjacent to said recording medium along said transport direction in said writing zone;
manually operable means for producing a drive signal upon manual operation thereof;
said drive means being electrically coupled to said manually operable means for driving said recording medium along said transport direction in response to said drive signal so as to move said recording medium towards said writing zone; and
scanning means placed over said recording medium at said extension zone for reading said stenograph sequence on said recording medium to produce a sequence of first electric signals adopted to be provided as said stenograph signal sequence to said processing means.

4,985,930

IMAGE DATA FILING SYSTEM AND IMAGE DATA CORRECTING METHOD

Haruo Takeda, Kawasaki; Toshihiro Hananoi, Kanagawa, and Sachiko Kawachiya, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 20, 1988, Ser. No. 246,978
Claims priority, application Japan, Sep. 24, 1987, 62-237125; Apr. 22, 1988, 63-98107
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—56 14 Claims



1. An image data filing system comprising:
filing means for storing image data;
retrieving means for retrieving a first selected portion of the image data which is indicative of at least one figure drawn with a first line quality from the filing means;
modifying means for modifying the retrieved image data portion into first image data indicative of the at least one figure drawn with a second line quality;
printing means for receiving the first image data and printing the at least one figure drawn with the second line quality onto a correction paper;
reading means for converting the at least one figure drawn with the second line quality along with revision markings added thereto from the correction paper into second image data;
converting means for converting the second image data into third image data by modifying the second image data to remove portions of the second image data indicative of the at least one figure leaving the revision markings having the first line quality; and
overlaying means for forming corrected image data from the first image data and the third image data.

DESIGN PATENTS

GRANTED JAN. 15, 1991

ERRATA

For CLASS	See PATENT NO.
D32-018	313,831
D21-148	313,851

DESIGNS

JANUARY 15, 1991

313,689
NUTRITIVE LOLLIPOPS
Melvin H. Epstein, R.R. 2 Box 2010 Bear Hill Rd., Chichester, N.H. 03263
Filed Sep. 9, 1987, Ser. No. 94,522
Term of patent 14 years
U.S. Cl. D1—102

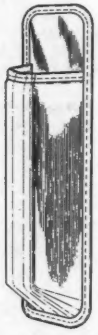
313,690
COVERALL FOR MOTORCYCLISTS OR THE LIKE
Hisashi Kushitani, No. 9-14, 4-chome, Yoga, Setagaya-ku Tokyo, Japan
Filed Jan. 14, 1987, Ser. No. 3,213
Term of patent 14 years
U.S. Cl. D2—29

313,691
COVERALL
Lorna Bassett, and Roger Bassett, both of 22024 106th Ave., SE., Snohomish, Wash. 98290
Filed Sep. 12, 1988, Ser. No. 242,510
Term of patent 14 years
U.S. Cl. D2—29

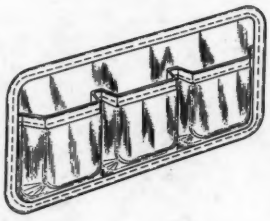
313,692
ATHLETIC SHORTS
Charles A. Karn, Durant, Okla., assignor to Ckarn Design, Durant, Okla.
Filed Apr. 7, 1988, Ser. No. 178,437
Term of patent 14 years
U.S. Cl. D2—42

313,693
BIB
Fredrica Coates, 960 Madison Dr., Earlysville, Va. 22936
Filed Mar. 3, 1989, Ser. No. 318,264
Term of patent 14 years
U.S. Cl. D2—226

313,694
ARTICLE HOLDER FOR VEHICLE INTERIOR
Gordon N. Mawhinney; Ted A. Bell; Daniel F. Lehner, and Timothy S. Cooksey, all of Coshocton, Ohio, assignors to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 28, 1986, Ser. No. 936,036
Term of patent 14 years
U.S. Cl. D3—40

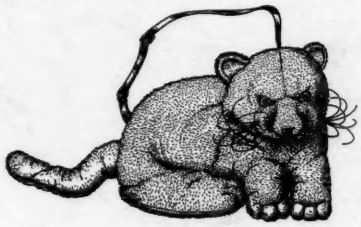


313,695
ARTICLE HOLDER FOR VEHICLE INTERIOR
Gordon N. Mawhinney; Ted A. Bell; Daniel E. Lehner, and Timothy S. Cooksey, all of Coshocton, Ohio, assignors to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 28, 1986, Ser. No. 936,040
Term of patent 14 years
U.S. Cl. D3—40

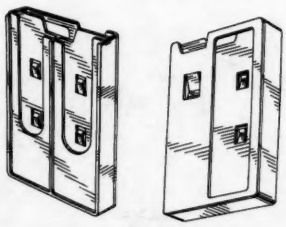


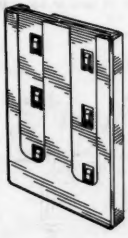
313,696
POODLE BAG
Catherine M. Senitt, R.R. #1, Carnarvon, Ontario, Canada K0M 1J0
Filed Aug. 9, 1988, Ser. No. 230,272
Claims priority, application Canada, Apr. 7, 1988, 07-04-88-11
Term of patent 14 years
U.S. Cl. D3—45

313,697
CAT BAG
Catherine M. Senitt, R.R. #1, Carnarvon, Ontario, Canada K0M 1J0
Filed Aug. 9, 1988, Ser. No. 230,273
Claims priority, application Canada, Apr. 7, 1988, 07-04-88-14
Term of patent 14 years
U.S. Cl. D3—45

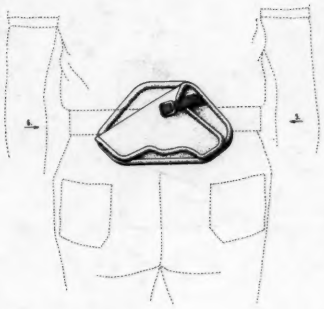


313,698
COMBINED COIN AND CREDIT CARD HOLDER
Christene Duffy, 61 Pemberton Ave., Willowdale, Ontario, Canada M2H 1Y2
Filed Sep. 11, 1987, Ser. No. 83,096
Term of patent 14 years
U.S. Cl. D3—56





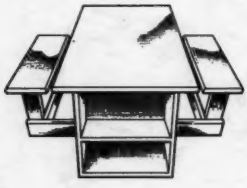
313,699
BALANCED BACK HOLSTER
Robert W. Remington, Kamiah, Id., assignor to Claude R. Wimer, Jr., Naples, Fla., a part interest
Filed Oct. 13, 1987, Ser. No. 106,761
The portion of the term of this patent subsequent to Nov. 10, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—101



313,700
APPLE-SHAPED PICTURE FRAME
Monte Zoldessy, 687 Bronx River Rd., Yonkers, N.Y. 10704
Filed Jul. 27, 1988, Ser. No. 224,866
Term of patent 14 years
U.S. Cl. D6—306

313,701
HOSIERY HANGER
Robert P. Leese, Amherst, Mass., assignor to Westvaco Corporation, New York, N.Y.
Filed Jul. 28, 1988, Ser. No. 225,150
Term of patent 14 years
U.S. Cl. D6—315

313,702
COMBINED PLAY TABLE AND BOOKCASE
Arnold D. Rich, 1821 Chino St., Santa Barbara, Calif. 93101, and Michael A. Pommerening, 4104 Modoc Rd., Santa Barbara, Calif. 93110
Filed Oct. 13, 1987, Ser. No. 109,841
Term of patent 14 years
U.S. Cl. D6—335



313,703
ARMCHAIR
Franco Moschini; Giampiero Pistacchi, and Werner Gremm, all of Tolentino, Italy, assignors to Poltrona Frau S.p.A., Tolentino, Italy
Filed Jun. 18, 1987, Ser. No. 64,297
Term of patent 14 years
U.S. Cl. D6—366

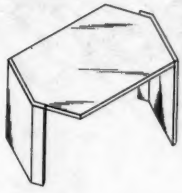
313,704
CHAIR FRAME
James R. Arthur, Jr., Birmingham, Ala., assignor to Winston Furniture Company, Inc., Birmingham, Ala.
Filed Jan. 5, 1987, Ser. No. 915
Term of patent 14 years
U.S. Cl. D6—370

313,705
CHAIR
Willi Hensel, Willingen; Jurgen Lange, Grafenau, and Reinhard Paulus, Cologne, all of Fed. Rep. of Germany, assignors to Mauser Waldeck AG, Waldeck, Fed. Rep. of Germany
Filed Apr. 15, 1987, Ser. No. 38,798
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, 1AR52/86
Term of patent 14 years
U.S. Cl. D6—372

313,706
COMBINED TABLE AND LAMP
Peter M. Yau Kee, Happy Valley, Hong Kong, assignor to Rosalco, Inc., Louisville, Ky.
Division of Ser. No. 371,028, Jun. 23, 1989. This application Jan. 26, 1990, Ser. No. 471,357
The portion of the term of this patent subsequent to Oct. 3, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—399

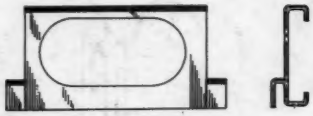
313,707
CABINET FOR AUDIO COMPONENTS OR THE LIKE
Eugene P. Henley, Jr., and Catina S. Waters, both of 233 N. Spring St., Greensboro, N.C. 27401
Filed Jan. 8, 1990, Ser. No. 461,804
Term of patent 14 years
U.S. Cl. D6—470

313,708
TABLE
Klaus Frank, Bad Muender, Fed. Rep. of Germany, assignor to Shukoh Co., Ltd., Tokyo, Japan
Filed Feb. 5, 1988, Ser. No. 153,011
Term of patent 14 years
U.S. Cl. D6—484

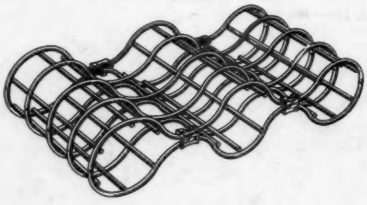


313,709
CABINET OR SIMILAR ARTICLE
Giovanni Offredi, Milan, Italy, assignor to Saporiti Italia S.p.A., Italy
Filed Aug. 29, 1986, Ser. No. 902,392
Term of patent 14 years
U.S. Cl. D6—446

313,710
CUTTING BOARD RECEPTACLE SUPPORT
Kenneth L. Liberty, 1314 Desert Rose Way, Olivenhain, Calif. 92024
Filed Jun. 29, 1987, Ser. No. 67,353
Term of patent 14 years
U.S. Cl. D6—462



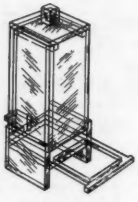
313,711
MODULAR WINE RACK
Steven K. Levine, 39 Gramercy Park North #6C, New York, N.Y. 10010
Continuation-in-part of Ser. No. 568,472, Jan. 5, 1984, Pat. No. Des. 289,587. This application Apr. 27, 1987, Ser. No. 43,138
Term of patent 14 years
U.S. Cl. D6—469



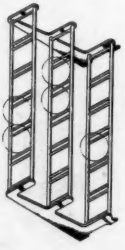
313,712
DIVIDER FOR USE IN A STORAGE DRAWER
Helmut Rupprechter, Lauterach, and Erich Roeck, Hoechst, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst, Austria
Filed Aug. 18, 1987, Ser. No. 86,587
Claims priority, application Austria, Feb. 27, 1987, 27430/447/1987; Feb. 27, 1987, 27431/447/1987
Term of patent 14 years
U.S. Cl. D6—491

313,713
JEWELRY HOLDER FOR PIERCED EARRINGS
Judith A. Weed, 8987 Wichita Dr., Boise, Id. 83709
Filed Nov. 16, 1987, Ser. No. 121,583
Term of patent 14 years
U.S. Cl. D6—513

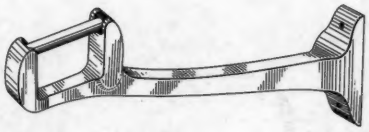
313,714
WAFER DISPENSER
Ross D. Pendill, 1208 Cranford Pl., Greeley, Colo. 80631
Filed Jul. 27, 1988, Ser. No. 224,785
Term of patent 14 years
U.S. Cl. D6—515

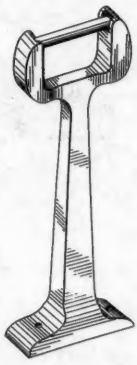


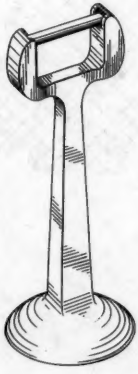
313,715
BALL RACK
Kiyomitsu Ohno, 2-9-9 Naka, Kunitachi, Tokyo 186, Japan
Filed Mar. 8, 1989, Ser. No. 320,936
Term of patent 14 years
U.S. Cl. D6—552



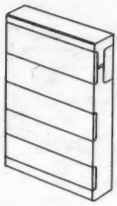
313,716
TOILET PAPER HOLDER
Maurice Jacques, R.R. #3, Hanover, Ontario, Canada N4N 3B9
Filed Oct. 24, 1989, Ser. No. 426,633
Term of patent 14 years
U.S. Cl. D6—523



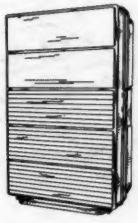




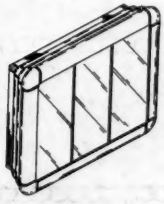
313,717
WALL-MOUNTABLE MODULAR SUPPORT PANEL
Anthony Odell, London, United Kingdom, assignor to Hendon International Hotel & Leisure Products, London, England
Filed Jul. 22, 1988, Ser. No. 223,767
Claims priority, application United Kingdom, Jan. 27, 1988, 1048014
Term of patent 14 years
U.S. Cl. D6—553



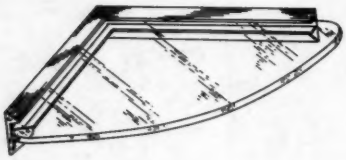
313,718
FIRST AID CABINET
Douglas M. Patton; Matthew F. Duncan, and Richard K. Jung, all of Orange County, Calif., assignors to McKesson Corporation, San Francisco, Calif.
Continuation of Ser. No. 68,054, Jun. 26, 1987, abandoned. This application Nov. 1, 1989, Ser. No. 430,965
Term of patent 14 years
U.S. Cl. D6—559



313,719
BATHROOM CABINET
Peter Bressler, Philadelphia, Pa.; Peter Byar, Willingboro, N.J., and Paul K. Rossi, Philadelphia, Pa., assignors to KSD Industries Inc.
Filed Jun. 15, 1988, Ser. No. 207,596
Term of patent 14 years
U.S. Cl. D6—561

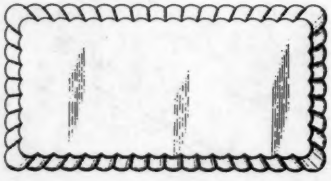


313,720
COMBINED CORNER SHELF AND BRACKET
Robert E. Sorenson, Comstock Park, and Walter L. Bessinger, Grand Haven, both of Mich., assignors to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.
Filed May 31, 1988, Ser. No. 200,578
Term of patent 14 years
U.S. Cl. D6—574

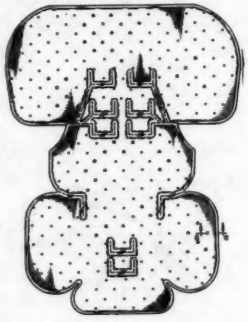


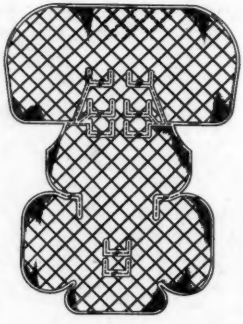
313,721
MATTRESS
Robert K. Parker, No. 6 Northridge Circle, Johnson City, Tenn. 37601
Filed Sep. 16, 1987, Ser. No. 97,089
Term of patent 14 years
U.S. Cl. D6—605

313,722
WATER MAT
Norman A. Axelson, 10268 Scarborough Circle, Bloomington, Minn. 55437
Filed Nov. 8, 1988, Ser. No. 268,532
Term of patent 14 years
U.S. Cl. D6—605

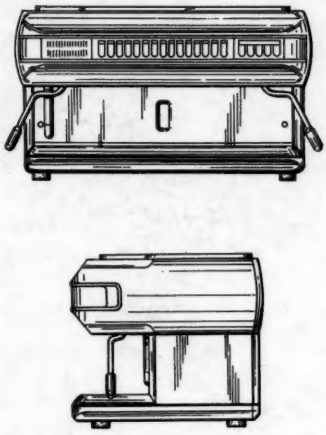


313,723
INFANT SEAT LINER
Janice J. Rankin, and Marilyn M. Pearson, both of Portland, Oreg., assignors to Weyerhaeuser Company, Tacoma, Wash.
Filed Apr. 29, 1988, Ser. No. 187,874
Term of patent 14 years
U.S. Cl. D6—611

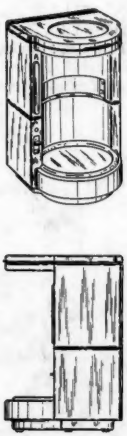




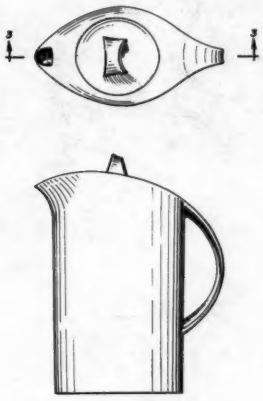
313,724
COFFEE MAKER
Francisco S. Piñon, Barcelona, Spain, assignor to Gaggia Espanola, S.A., Barcelona, Spain
Filed Jul. 26, 1988, Ser. No. 224,131
Claims priority, application Spain, Feb. 11, 1988, 115114
Term of patent 14 years
U.S. Cl. D7—308



313,725
COFFEE MAKER
Aloysius J. M. Beeren, Haren, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 25, 1988, Ser. No. 148,399
Claims priority, application United Kingdom, Jul. 24, 1987, 1043667
Term of patent 14 years
U.S. Cl. D7—309

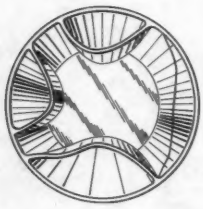


313,726
PITCHER OR SIMILAR ARTICLE
Ludwig Scherer, Luxembourg, Luxembourg, assignor to Villeroy & Boch S.A.R.L., Luxembourg, Luxembourg
Division of Ser. No. 146,804, Jan. 22, 1988. This application Apr. 19, 1990, Ser. No. 511,385
Term of patent 14 years
U.S. Cl. D7—317

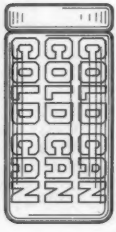


313,727
COMBINED POT AND REMOVABLE HANDLE COVER UNIT
Oscar Gamez, Peru 2898, San Justo Buenos Aires, Argentina
Filed Nov. 30, 1987, Ser. No. 126,889
Term of patent 14 years
U.S. Cl. D7—360

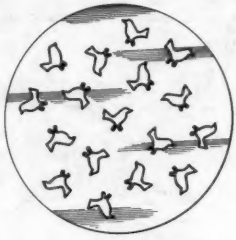
313,728
BOWL
Luis R. Oropeza, 1422½ Allston, Houston, Tex. 77008
Filed Nov. 20, 1986, Ser. No. 933,674
Term of patent 14 years
U.S. Cl. D7—556



313,729
INSULATED JACKET FOR CANNED BEVERAGES
Mark T. Cox, 599 Agate St., Astoria, Oreg. 97103
Filed Sep. 2, 1988, Ser. No. 239,843
Term of patent 14 years
U.S. Cl. D7—608



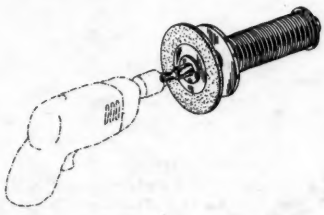
313,730
PIE TOPPER PLATE
Joan P. Wolff, Harrison, N.Y., assignor to Coats & Clark, Inc., Yorktown Heights, N.Y.
Filed Apr. 15, 1988, Ser. No. 182,042
Term of patent 14 years
U.S. Cl. D7—675



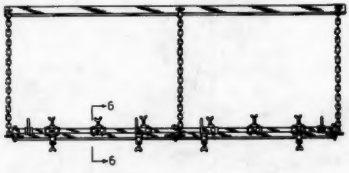
313,731
RATCHET EXTENDER
James A. Crawford, 8 Park Ct., Farmingdale, N.Y. 11735
Filed Sep. 2, 1988, Ser. No. 239,854
Term of patent 14 years
U.S. Cl. D8—25

313,732
BOTTLE OPENER
John W. Adcock, Hawthorn, Australia, assignor to Rising Star Pty. Ltd., Australia
Filed Oct. 7, 1987, Ser. No. 105,322
Claims priority, application Australia, Apr. 7, 1987, 1154/87
Term of patent 14 years
U.S. Cl. D8—38

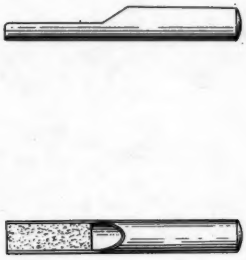
313,733
COMBINED GROUT SAW AND HANDLE ATTACHMENT FOR A DRILL
Anthony C. Pastore, 10523 Horizon Dr., Spring Hill, Fla. 33526
Filed Aug. 6, 1987, Ser. No. 82,413
Term of patent 14 years
U.S. Cl. D8—67



313,734
PARTS HOLDER FOR SPRAYING PAINT
Ronald Gospodarek, 709 E. 14th St.., Hobart, Ind. 46342
Filed Nov. 2, 1987, Ser. No. 115,099
Term of patent 14 years
U.S. Cl. D8—71

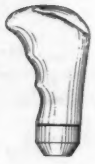


313,735
CUE TIP SHAPING TOOL
William S. Walker, 74 Scott Dr., Greenfaulds, Cumbernauld by Glasgow, United Kingdom
Filed Nov. 7, 1986, Ser. No. 928,142
Claims priority, application United Kingdom, Oct. 5, 1986, 1034013
Term of patent 14 years
U.S. Cl. D8—91

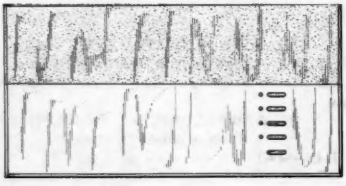


313,736
TRIGGER-ACTUATED GLUE GUN
Ronald J. Boliver, Auburn, and Richard E. Wagner, Webster, both of Mass., assignors to The Parker Group, Northboro, Mass.
Filed May 13, 1988, Ser. No. 204,901
Term of patent 14 years
U.S. Cl. D8—14.1

313,737
KNOB FOR A GEAR LEVER
Marco Cattaneo, Pavia, Italy, assignor to Momo S.p.A., Mikano, Italy
Filed Jun. 29, 1988, Ser. No. 213,170
Claims priority, application Italy, Mar. 10, 1988, 20828/B/88
Term of patent 14 years
U.S. Cl. D8—307

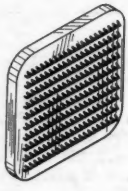


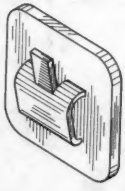
313,738
FACE PLATE FOR LIGHTING CONTROL
Noel Mayo, Philadelphia; Zalman A. Lisa, Allentown; Joel S. Spira, Coopersburg, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Apr. 21, 1987, Ser. No. 40,600
Term of patent 14 years
U.S. Cl. D8—353



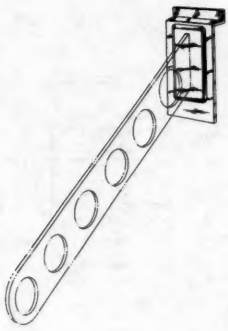
313,739
CLAMP COMPONENT
George E. Preston, 39 Gallup, Mt. Clemens, Mich. 48066
Filed Aug. 5, 1987, Ser. No. 82,069
Term of patent 14 years
U.S. Cl. D8—354

313,740
FABRIC WALL GRIPPING DEVICE
Larry D. Witt, 3234 Anne Clr., Huntington Beach, Calif. 92649
Filed Feb. 25, 1988, Ser. No. 160,107
Term of patent 14 years
U.S. Cl. D8—373

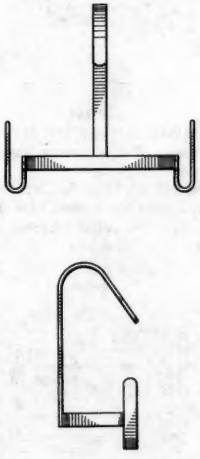




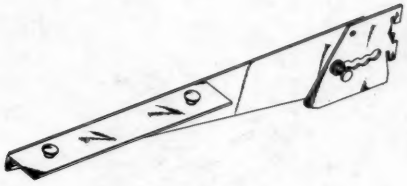
313,741
WALL ATTACHMENT HOLDER FOR A DISPLAY DEVICE
Brian M. Levy, Waterloo, Australia, assignor to Australian Slatwall Industries Pty. Limited, New South Wales, Australia
Filed Jul. 7, 1988, Ser. No. 216,091
Claims priority, application Australia, Jan. 29, 1988, 0256/88
Term of patent 14 years
U.S. Cl. D8—373



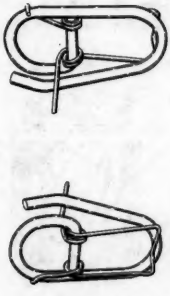
313,742
PAINT CAN HOOK
W. C. Ruff, Caflisch Rd., Clymer, N.Y. 14724
Filed Sep. 2, 1988, Ser. No. 239,857
Term of patent 14 years
U.S. Cl. D8—373



313,743
SHELVING BRACKET
Arthur R. Mastrodicasa, 36 Donnelly Dr., Dover, Mass. 02030
Filed Jun. 21, 1988, Ser. No. 209,473
Term of patent 14 years
U.S. Cl. D8—381



313,744
ANCHOR CLIP
William J. Knight, 55 Main Street, Alstonville, New South Wales, Australia 2477
Filed Jul. 26, 1988, Ser. No. 224,477
Claims priority, application Australia, Feb. 15, 1988, 0448/88
Term of patent 14 years
U.S. Cl. D8—395

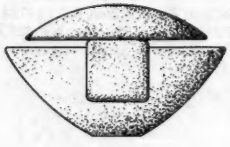


313,745
NOVELTY PACKAGE
Daniel A. Akman, 9 Featherwood Ct., Suite 33, Silver Spring, Md. 20904
Filed Jul. 31, 1986, Ser. No. 891,176
Term of patent 14 years
U.S. Cl. D9—307

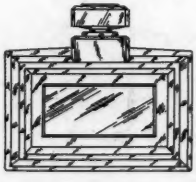
313,746
COSMETIC CONTAINER
David Hoenig, East Brunswick, N.J., assignor to Revlon, Inc., New York, N.Y.
Filed Mar. 18, 1988, Ser. No. 171,509
Term of patent 14 years
U.S. Cl. D9—337

313,747
BOTTLE
Randy L. Martin, Box 1132, Wynard, Saskatchewan, Canada S0A 4T0
Filed Aug. 25, 1987, Ser. No. 89,261
Term of patent 14 years
U.S. Cl. D9—350

313,748
BOTTLE FOR PERFUME, TOILET WATER OR THE LIKE
Pierre Dinand, Levallois-Perret, France, assignor to Dalmas SpA, Italy
Filed Jun. 18, 1987, Ser. No. 63,901
Claims priority, application France, Dec. 23, 1986, 866810
Term of patent 14 years
U.S. Cl. D9—384



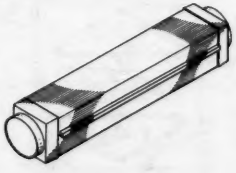
313,749
PERFUME BOTTLE OR THE LIKE
Pierre Dinand, Levallois-Perret, France, assignor to DIS.PR.A. SpA, Milan, Italy
Filed Sep. 11, 1987, Ser. No. 95,455
Claims priority, application France, Mar. 12, 1987, 871423
Term of patent 14 years
U.S. Cl. D9—384



313,750
CONTAINER WALL
Stuart A. York, Tariffville, and Dan Weissmann, Simsbury, both of Conn., assignors to Hoover Universal, Inc., Plymouth, Mich.
Filed Mar. 30, 1988, Ser. No. 175,132
Term of patent 14 years
U.S. Cl. D9—394

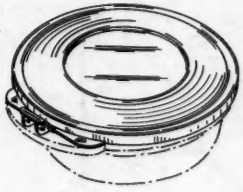
313,751
BOTTLE
Albert K. Taylor, Southaven, Miss., assignor to Plough, Inc., Memphis, Tenn.
Filed Jul. 11, 1988, Ser. No. 222,646
Term of patent 14 years
U.S. Cl. D9—408

313,752
CONTAINER FOR SCROLL
Bertie J. Dyble, 2441 Mt. Vernon Ave., Janesville, Wis. 53545
Filed Apr. 8, 1988, Ser. No. 179,902
Term of patent 14 years
U.S. Cl. D9—414

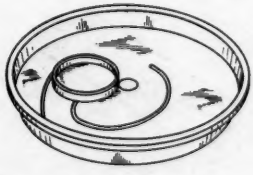


313,753
PACKAGE FOR EARPHONE
Yoshie Nagasaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Sep. 16, 1988, Ser. No. 245,382
Claims priority, application Japan, Mar. 17, 1988, 63-10883
Term of patent 14 years
U.S. Cl. D9—415

313,754
CONTAINER LID
James F. Pomroy, P.O. Box 43610, St. Paul, Minn. 55164
Filed Jan. 11, 1988, Ser. No. 142,408
Term of patent 14 years
U.S. Cl. D9—435



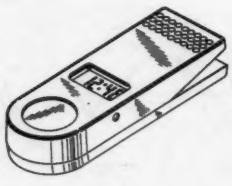
313,755
PULL TAB COVER
Lars-Erik Piltz, Konventsv. 3, Dalby, Sweden 240 10
Filed Aug. 16, 1988, Ser. No. 232,890
Claims priority, application Sweden, Feb. 16, 1988, 88-377
Term of patent 14 years
U.S. Cl. D9—438



313,756
PIANO CLOCK
Kam W. Ng, Kowloon, Hong Kong, assignor to Silcon Electronics Company Limited, Kowloon, Hong Kong
Filed Jan. 19, 1988, Ser. No. 145,497
Claims priority, application United Kingdom, Jul. 23, 1987, 1043642
Term of patent 14 years
U.S. Cl. D10—6

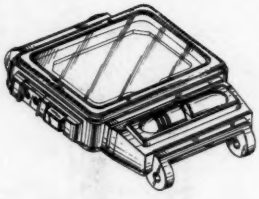
313,757
PENDULUM INDICATOR CLOCK
William B. Beebe, 2832 Main St., Bethlehem, Pa. 18017
Filed Jan. 27, 1987, Ser. No. 7,808
Term of patent 14 years
U.S. Cl. D10—28

313,758
COMBINED DIGITAL WATCH AND CLIP
Odo H. Klose, Wuppertal, Fed. Rep. of Germany, assignor to Prisenta KG, Weber & Co., Solingen, Fed. Rep. of Germany
Filed May 4, 1987, Ser. No. 46,413
Term of patent 14 years
U.S. Cl. D10—31

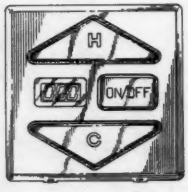


313,759
COMBINED CLOCK AND CLIP
Hidekatsu Nomizu, Niigata, Japan, assignor to Twinbird Industrial Company Limited, Niigata, Japan
Filed Nov. 16, 1987, Ser. No. 121,723
Claims priority, application Japan, Aug. 7, 1987, 62-32484
Term of patent 14 years
U.S. Cl. D10—31

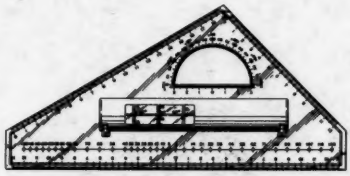
313,760
WRIST WATCH
John T. Houlihan, Watertown, Conn., assignor to Timex Corporation, Middlebury, Conn.
Filed Feb. 12, 1988, Ser. No. 155,652
Term of patent 14 years
U.S. Cl. D10—38



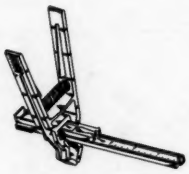
313,761
ACTUATOR PLATE FOR TEMPERATURE CONTROL VALVE
Peter W. Bressler, Philadelphia, Pa., assignor to Memrysafe, Inc., Norwalk, Conn.
Filed Jul. 15, 1988, Ser. No. 219,163
Term of patent 14 years
U.S. Cl. D10—60



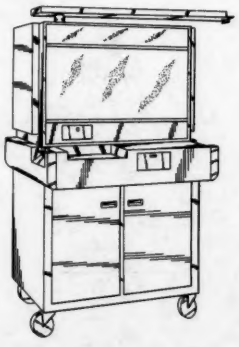
313,762
SET-SQUARE
Keith W. Chan; Yu S. Man; Eileen Pau Pui-Fun, and Ivy Ma Shiu-Ping, all of 22G, Yuan Kung Mansion, Taikoo Shing, Hong Kong
Filed May 25, 1988, Ser. No. 198,507
Term of patent 14 years
U.S. Cl. D10—62



313,763
VEHICLE AIR BRAKE SLACK GAUGE
George Hamatani, Rte. 1, Box 400, Clarksburg, Calif. 95612
Filed Apr. 4, 1988, Ser. No. 177,305
Term of patent 14 years
U.S. Cl. D10—70

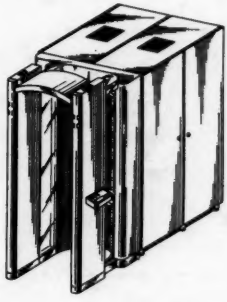


313,764
DIAGNOSTIC ANALYZER
James R. Shaffer, Mount Prospect, and Lee F. Radtke, Lake Zurich, both of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.
Filed Jan. 28, 1987, Ser. No. 8,610
Term of patent 14 years
U.S. Cl. D10—75

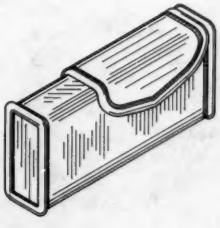


313,765
BATHROOM SCALE
Günther Storsberg, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany
Filed Apr. 20, 1987, Ser. No. 40,327
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 5 MR 9712; Feb. 13, 1987, 5 MR 9749
Term of patent 14 years
U.S. Cl. D10—92

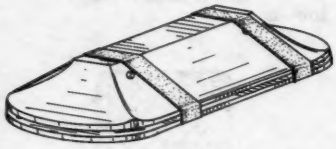
313,766
WALK-IN BOOTH
Michel D. Arney, Roslindale, and Gianfranco Zaccai, Boston, both of Mass., assignors to Thermedics, Inc., Woburn, Mass.
Filed Nov. 18, 1988, Ser. No. 273,436
Term of patent 14 years
U.S. Cl. D10—104



313,767
INFLATABLE DISTRESS BALLOON KIT
Paul W. Rosebush, Box 105-A1, Brownville, Me. 04414, and Kenneth L. Perry, Box 72, Cherryfield, Me. 04622
Filed Sep. 2, 1988, Ser. No. 239,855
Term of patent 14 years
U.S. Cl. D10—109



313,768
TURKEY CALLER
William T. White, Jr., Rte. 3 - Box 393, Abbeville, Ala. 36310
Filed Aug. 15, 1988, Ser. No. 231,992
Term of patent 14 years
U.S. Cl. D10—119



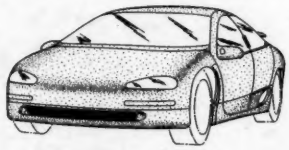
313,769
TENNIS SCORE KEEPER
Peter Catuzzi, P.O. Box 10321, Naples, Fla. 33941
Filed Oct. 6, 1988, Ser. No. 254,121
Term of patent 14 years
U.S. Cl. D10—46.1

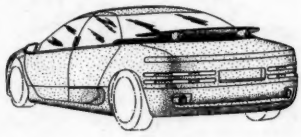
313,770
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 5, 1988, Ser. No. 280,266
Claims priority, application Hague, Jun. 3, 1988, DM/011089
Term of patent 14 years
U.S. Cl. D11—3

313,771
JEWELRY SETTING
Steven Kulla, 15 Bank St., Stamford, Conn. 06901
Filed Feb. 1, 1988, Ser. No. 150,717
Term of patent 14 years
U.S. Cl. D11—92

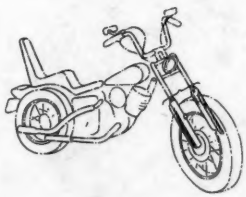
313,772
ARTIFICIAL CHRISTMAS TREE CENTERPIECE
Richard A. Beauregard, R.D. #1, Box 47, Canaan, Vt. 05903
Filed Apr. 14, 1988, Ser. No. 182,079
Term of patent 14 years
U.S. Cl. D11—118

313,773
AUTOMOBILE BODY
Kenneth N. Walling, Leonard, Mich.; Kevin R. Verduyn, Carlsbad, Calif., and Daniel J. Sims, Rochester Hills, Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Mar. 14, 1988, Ser. No. 168,341
Term of patent 14 years
U.S. Cl. D12—92

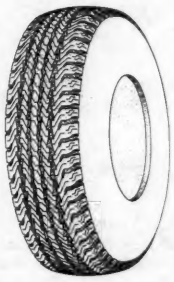




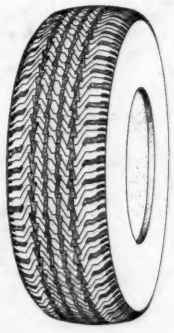
313,774
PAIR OF FRONT FORK COVERS FOR A MOTORCYCLE
Boyd R. Hauer, 2535 Kiska Ave., Hacienda Heights, Calif. 91745
Filed Jul. 5, 1988, Ser. No. 215,426
Term of patent 14 years
U.S. Cl. D12—126



313,775
TIRE
Terry J. Waibel, Wadsworth; Michael A. Kolowski, Mogadore; William M. Hopkins, Hudson; Robert A. Brightwell, Uniontown; Frederick W. Miller, and Richard L. Galante, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 14, 1988, Ser. No. 271,185
Term of patent 14 years
U.S. Cl. D12—143



313,776
TIRE
William M. Hopkins, Hudson; Robert A. Brightwell, Uniontown; Frederick W. Miller, and Richard L. Galante, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 14, 1988, Ser. No. 271,186
Term of patent 14 years
U.S. Cl. D12—143

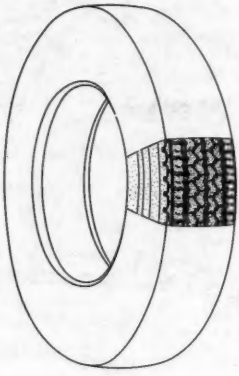


313,777
AUTOMOBILE TIRE
Fumikazu Yamashita, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Oct. 24, 1988, Ser. No. 261,475
Claims priority, application Japan, Apr. 26, 1988, 63-16992
Term of patent 14 years
U.S. Cl. D12—146

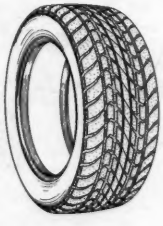
313,778
AUTOMOBILE TIRE
Toshiaki Kobayashi; Toru Tsuda, and Yuki Hara, all of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Nov. 1, 1988, Ser. No. 265,725
Claims priority, application Japan, Jun. 30, 1988, 63-25771
Term of patent 14 years
U.S. Cl. D12—146

313,779
VEHICLE TIRE
Kotaro Tsutsumi, Tokyo, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Mar. 15, 1988, Ser. No. 170,973
Claims priority, application Japan, Sep. 16, 1987, 62-37905
Term of patent 14 years
U.S. Cl. D12—147

313,780
TIRE
Edward M. Remick, Taylors, S.C., assignor to Michelin Recherche et Technique, Fribourg, Switzerland
Division of Ser. No. 30,930, Apr. 1, 1987, Pat. No. Des. 305,523.
This application Nov. 2, 1989, Ser. No. 430,350
Term of patent 14 years
U.S. Cl. D12—146

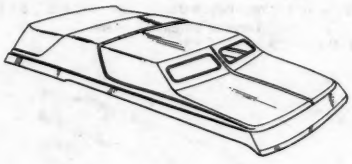


313,781
AUTOMOBILE TIRE
Yutaka Kuroda, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jun. 13, 1988, Ser. No. 206,413
Claims priority, application Japan, Dec. 15, 1987, 62-51126; Dec. 15, 1987, 62-51127
Term of patent 14 years
U.S. Cl. D12—147



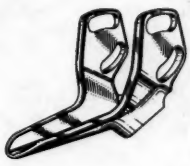
313,782
AUTOMOBILE TIRE
Hirohisa Hazama; Masahiro Ogata, both of Hiratsuka, and Izumi Kuramochi, Tokyo, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Jun. 28, 1988, Ser. No. 212,755
Claims priority, application Japan, Feb. 8, 1988, 63-4441
Term of patent 14 years
U.S. Cl. D12—148

313,783
CONVERSION ROOF FOR VANS OR THE LIKE
Otis C. Borum, Silver Springs, and Martin O. Borum, Green Cove Springs, both of Fla., assignors to A & S Fiberglass, Inc., Jacksonville, Fla.
Filed Oct. 9, 1987, Ser. No. 106,328
The portion of the term of this patent subsequent to Jul. 3, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—156

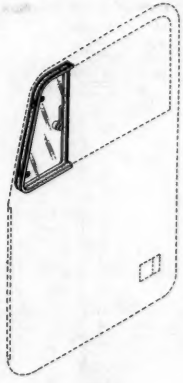


313,784
TRUCK GRILL UNIT
Huston Marlowe, Orinda, and John Lindsley, Felton, Calif., assignors to Paccar Inc., Bellevue, Wash.
Filed Sep. 15, 1988, Ser. No. 245,067
Term of patent 14 years
U.S. Cl. D12—163

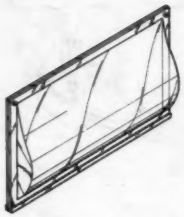
313,785
VEHICLE THROTTLE LEVER
Michel Bourret, Drummondville, Canada, assignor to Bombardier, Inc., Canada
Filed Dec. 29, 1988, Ser. No. 291,872
Claims priority, application Canada, Aug. 16, 1988, 16-08-88-2
Term of patent 14 years
U.S. Cl. D12—179



313,786
MOTOR VEHICLE VENT WINDOW UNIT
Ross S. Sasamura, and John H. Jewell, II, both of Fremont, Calif., assignors to Paccar Inc., Bellevue, Wash.
Filed Apr. 11, 1988, Ser. No. 180,251
Term of patent 14 years
U.S. Cl. D12—181

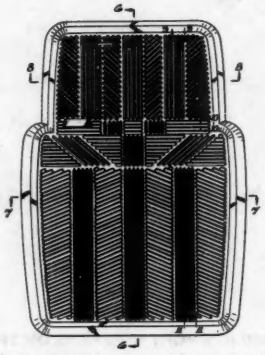


313,787
VEHICLE LICENSE PLATE COVER
Clarence A. Williams, ACU-2, Trans. Division NAB, Little Creek, Va. 23521
Filed Jul. 27, 1988, Ser. No. 224,480
Term of patent 14 years
U.S. Cl. D12—193



313,788
FUEL LINE GAS CAP
John T. Odekirk, P.O. Box 30331, Lafayette, La. 70503
Filed May 18, 1988, Ser. No. 195,540
Term of patent 14 years
U.S. Cl. D12—197

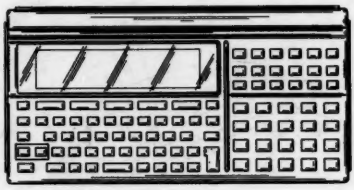
313,789
FLOOR MAT
Robert Thundercloud, Chino, Calif., assignor to Kraco Enterprises, Inc., Compton, Calif.
Filed Jul. 11, 1988, Ser. No. 216,991
Term of patent 14 years
U.S. Cl. D12—203



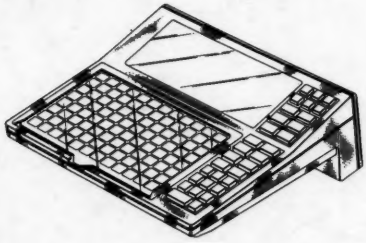
313,790
ELECTRICAL PLUG
Ryuzo Hirabayashi, Tokyo, Japan, assignor to MIT Inc., Tokyo, Japan
Filed May 29, 1987, Ser. No. 55,256
Claims priority, application Japan, Apr. 21, 1987, 62-15357
Term of patent 14 years
U.S. Cl. D13—133

313,791
ABSORBER OF ELECTRIC NOISE
Kazuhiro Matsui, Toyoake, Japan, assignor to Kitagawa Industries Co., Ltd., Japan
Division of Ser. No. 368,943, Jun. 13, 1989, abandoned, which is a continuation of Ser. No. 141,782, Jan. 11, 1988, abandoned.
This application Aug. 2, 1989, Ser. No. 388,368
Claims priority, application Japan, Jan. 20, 1987, 62-10734
Term of patent 14 years
U.S. Cl. D13—199

313,792
COMBINED COMPUTER AND COVER
Masaji Sawada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jul. 13, 1988, Ser. No. 218,699
Claims priority, application Japan, Jan. 14, 1988, 63-1263
Term of patent 14 years
U.S. Cl. D14—100



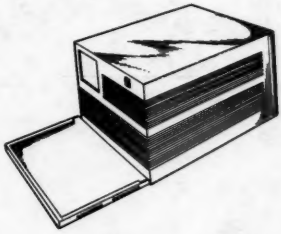
313,793
INPUT/OUTPUT TERMINAL WITH DISPLAY
Shuzo Kato, Hiratsuka, Japan, assignor to NCR Corproation, Dayton, Ohio
Filed Apr. 26, 1989, Ser. No. 343,223
Claims priority, application Japan, Dec. 5, 1988, 63-47226
Term of patent 14 years
U.S. Cl. D14—100



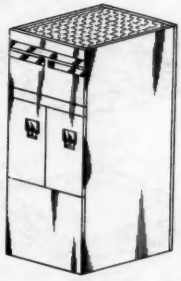
313,794
AUTO SERVICE REMINDER TERMINAL
Daniel J. Coleman, One Raynham Rd., Glen Cove, N.Y. 11542
Filed Jul. 20, 1989, Ser. No. 382,323
Term of patent 14 years
U.S. Cl. D14—100

313,795
DESKTOP-COMPUTER HOUSING OR SIMILAR ARTICLE
Dale C. Bina, Wheaton, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Division of Ser. No. 92,114, Sep. 2, 1987, Pat. No. 308,965. This application Feb. 12, 1990, Ser. No. 478,908
Term of patent 14 years
U.S. Cl. D14—100

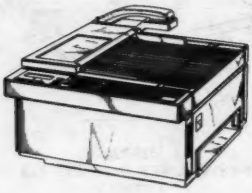
313,796
DESKTOP-COMPUTER HOUSING OR SIMILAR ARTICLE
Dale C. Bina, Wheaton, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Division of Ser. No. 92,114, Sep. 2, 1987, Pat. No. 308,965. This application Feb. 12, 1990, Ser. No. 478,895
Term of patent 14 years
U.S. Cl. D14—102



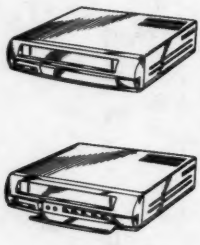
313,797
TAPE CARTRIDGE DATA STORAGE SYSTEM
Dwyatt H. Fenn, Longmont; James W. McCarty, Arvada, and George Reichenberg, Lafayette, all of Colo., assignors to Aspen Peripherals Corp., Longmont, Colo.
Filed Apr. 18, 1988, Ser. No. 182,750
Term of patent 14 years
U.S. Cl. D14—108



313,798
FACSIMILE TRANSCEIVER
Kiyotaka Morozumi, Fujisawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Feb. 17, 1988, Ser. No. 156,559
Claims priority, application Japan, Aug. 28, 1987, 62-35331
Term of patent 14 years
U.S. Cl. D14—118

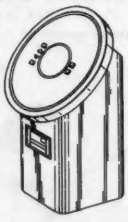


313,799
VIDEO CASSETTE RECORDER
Jae J. Shim, Kyungki, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 24, 1988, Ser. No. 160,066
Claims priority, application Rep. of Korea, Aug. 31, 1987, 13251/1987
Term of patent 14 years
U.S. Cl. D14—135



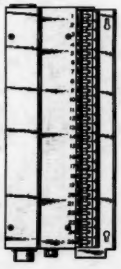
313,800
COMBINED HANDSET TELEPHONE AND STAND THEREFOR
Paul C. Appleby, London, England, assignor to Dialatron Limited, Chessington, England
Filed Mar. 31, 1988, Ser. No. 175,734
Claims priority, application United Kingdom, Oct. 1, 1987, 1045318
Term of patent 14 years
U.S. Cl. D14—151

313,801
JUKEBOX FOR COMPACT DISCS
Bernard Hart, Tingley, England, assignor to Arbiter Group Plc., London, England
Filed Apr. 6, 1988, Ser. No. 178,281
Claims priority, application United Kingdom, Oct. 7, 1987, 1045435
Term of patent 14 years
U.S. Cl. D14—173

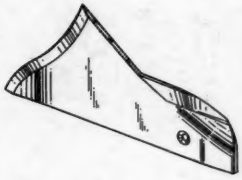


313,802
COMBINED MICROPHONE AND HOLDER
Andreas Peiker, Terracinsweg 5, D-6380 Bad Homburg v. d. Höhe, Fed. Rep. of Germany
Filed Feb. 18, 1987, Ser. No. 16,175
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1986, 10 MR 681
Term of patent 14 years
U.S. Cl. D14—227

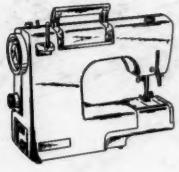
313,803
TELEPHONE NETWORK INTERFACE APPARATUS
Thomas J. Collins, Wall Township, Monmouth County, and Peter Quintana, Brick, both of N.J., assignors to Keptel, Inc., Tinton Falls, N.J.
Filed Apr. 29, 1988, Ser. No. 187,890
Term of patent 14 years
U.S. Cl. D14—240



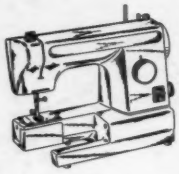
313,804
SIDE PLATE FOR AN EARTHWORKING SEED PLANTING AND FERTILIZING TOOL
Kevin M. Anderson, P.O. Box 32, Andover, S. Dak. 57422
Filed Oct. 3, 1988, Ser. No. 251,862
Term of patent 14 years
U.S. Cl. D15—29

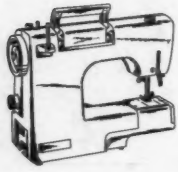


313,805
SEWING MACHINE
Ichirou Shibayama, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan
Filed May 17, 1988, Ser. No. 195,632
Claims priority, application Japan, Nov. 20, 1987, 62-47514
The portion of the term of this patent subsequent to Jan. 8, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—70

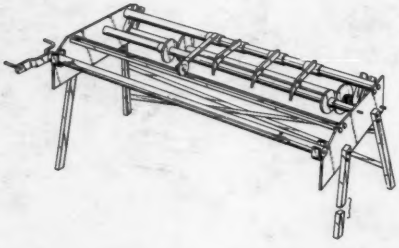


313,806
SEWING MACHINE
Ichirou Shibayama, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan
Filed May 17, 1988, Ser. No. 195,633
Claims priority, application Japan, Nov. 20, 1987, 62-47513
The portion of the term of this patent subsequent to Jan. 8, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—70

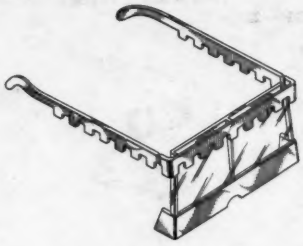




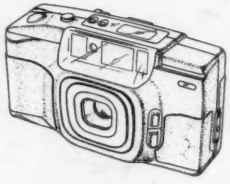
313,807
MESH SLITTER
Phillip G. Daniel, 131 Pinewood Dr., Tuttle, Okla. 73089-9803
Filed Apr. 13, 1987, Ser. No. 37,400
Term of patent 14 years
U.S. Cl. D15—127



313,808
SUNGLASSES
Ron Des Marais, 920 E. California, Glendale, Calif. 91206
Filed Mar. 28, 1988, Ser. No. 174,620
Term of patent 14 years
U.S. Cl. D16—102



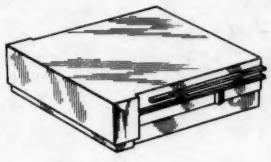
313,809
CAMERA
Hiroshi Obara, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Apr. 12, 1988, Ser. No. 180,802
Claims priority, application Japan, Oct. 12, 1987, 62-041684
Term of patent 14 years
U.S. Cl. D16—218



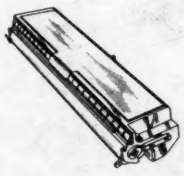
313,810
GUITAR
Kenneth Walker, P.O. Box 689, Los Angeles, Calif. 90047
Filed Jun. 23, 1988, Ser. No. 211,398
Term of patent 14 years
U.S. Cl. D17—18

313,811
TYPEWRITER
Hiroshi Sakaguchi, and Toshiya Takahashi, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jun. 14, 1988, Ser. No. 206,615
Claims priority, application Japan, Dec. 26, 1987, 62-53654
Term of patent 14 years
U.S. Cl. D18—1

313,812
INK CARTRIDGE
Takashi Yomo, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 12, 1988, Ser. No. 180,796
Claims priority, application Japan, Oct. 19, 1987, 62-42801
Term of patent 14 years
U.S. Cl. D18—22

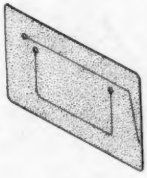


313,813
DEVELOPING UNIT FOR COPIERS
Hiroyuki Tokuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 12, 1988, Ser. No. 218,077
Claims priority, application Japan, Jan. 19, 1988, 63-1803
The portion of the term of this patent subsequent to Jan. 1, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—36

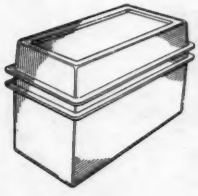


313,814
COPYING MACHINE
Takeshi Komada, Shimosueyoshi; Tomohiko Hirata, Kawasaki; Minoru Aoyama, and Yosuke Ohsawa, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 18, 1988, Ser. No. 220,112
Claims priority, application Japan, Jan. 19, 1988, 63-1807
Term of patent 14 years
U.S. Cl. D18—37

313,815
BOOKMARK
Jerald Bloch, 16152 Mateo St., San Leandro, Calif. 94578
Filed Jun. 24, 1988, Ser. No. 211,531
Term of patent 14 years
U.S. Cl. D19—34

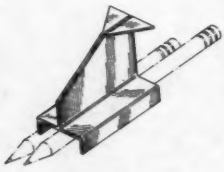


313,816
FILE BOX
Dale M. Evans, Windsor, Wis., assignor to Don Evans, Inc., DeForest, Wis.
Filed Aug. 24, 1987, Ser. No. 88,207
Term of patent 14 years
U.S. Cl. D19—75

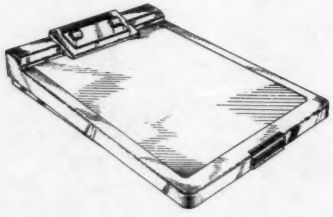


313,817
FILE CABINET
Fred Thomas, Pleasant Hill, Calif., assignor to Staco Products Corporation, Pleasant Hill, Calif.
Filed May 19, 1986, Ser. No. 864,894
Term of patent 14 years
U.S. Cl. D19—75

313,818
PENCIL HOLDER
William S. Moore, 1005 W. Main, Lancaster, Tex. 75146
Filed Aug. 31, 1987, Ser. No. 91,014
Term of patent 14 years
U.S. Cl. D19—83

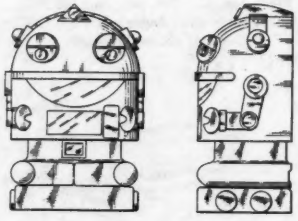


313,819
CLIP BOARD
Charles W. Craft, Jr., Apple Creek; Kent W. Murphy, Wooster, and Jim Couch, Worthington, all of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Feb. 29, 1988, Ser. No. 161,617
Term of patent 14 years
U.S. Cl. D19—88

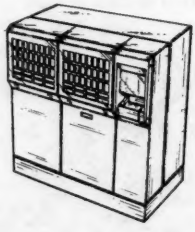


313,820
HOLDER FOR CARDS AND LETTERS
Geraldine M. Wright, 229 Windcrest Dr., Camillus, N.Y. 13031
Filed Jun. 8, 1987, Ser. No. 59,741
Term of patent 14 years
U.S. Cl. D19—90

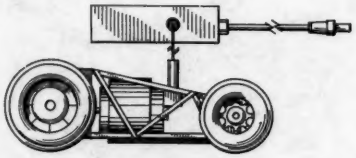
313,821
VENDING MACHINE
Burton O. Lynch, Taipei, Taiwan, and Brian Warkentin, Los Gatos, Calif., assignors to Amusement, Inc., Sherman Oaks, Calif.
Filed May 18, 1987, Ser. No. 50,371
Term of patent 14 years
U.S. Cl. D20—3

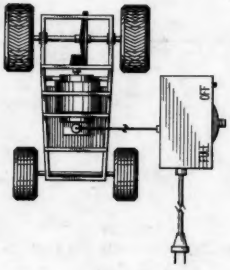


313,822
VIDEO TAPE DISPENSING MACHINE
Donald A. Brown, 8103 White Oak Ave., Reseda, Calif. 91335; Ichiro Iwasaki; Daniel M. Koo, both of 3137 Emerald Isle Dr., Glendale, Calif. 91206; Ravi Sawhney, 7407 Topanaga Canyon Blvd., Canoga Park, Calif. 91303, and Dennis J. Wasserman, 29 Marion, #1, Pasadena, Calif. 91106
Filed May 18, 1987, Ser. No. 51,481
Term of patent 14 years
U.S. Cl. D20—4

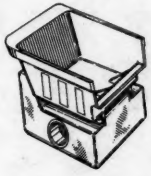


313,823
REMOTELY CONTROLLED TOY TRUCK
Michael J. Scheckel, 520 3rd Ave. S., Clinton, Iowa 52732
Filed Jan. 25, 1988, Ser. No. 147,676
Term of patent 14 years
U.S. Cl. D21—128



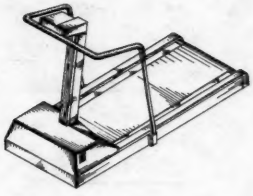


313,824
TOY DUMP TRUCK ATTACHMENT
Herbert C. Weiland, Rancho Palos Verdes, Calif., assignor to Clover Toys, Inc., La Mirada, Calif.
Filed Jun. 20, 1988, Ser. No. 208,544
Term of patent 14 years
U.S. Cl. D21—141

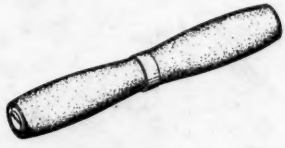


313,825
TOY STUFFED BEAR FIGURE
Laurie D. Wyeth, 123 Quail Creek Dr., San Marcos, Tex. 78666
Filed Jun. 19, 1987, Ser. No. 65,003
Term of patent 14 years
U.S. Cl. D21—159

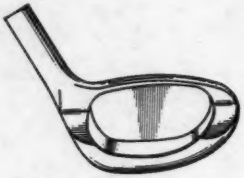
313,826
EXERCISE TREADMILL
James S. Birrell, Seattle; Timothy O. Armstrong, Bellevue; Kenneth G. Real, Redmond, and Gary M. Bang, Edmonds, all of Wash., assignors to Precor Incorporated, Bothell, Wash.
Continuation-in-part of Ser. No. 102,201, Oct. 2, 1987, Pat. No. D. 303,414. This application Oct. 12, 1988, Ser. No. 254,793
Term of patent 14 years
U.S. Cl. D21—194



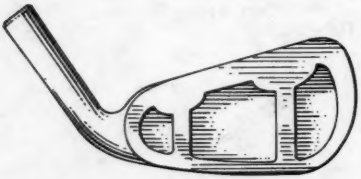
313,827
HAND EXERCISER
Carlos R. Smith, 27 Arbor End, Smyrna, Ga. 30080
Filed Aug. 10, 1988, Ser. No. 230,509
Term of patent 14 years
U.S. Cl. D21—198



313,828
METAL GOLF CLUB HEAD
Richard C. Wilson, 2066 Vista, Arcadia, Calif. 91006
Filed Jul. 29, 1987, Ser. No. 79,277
Term of patent 14 years
U.S. Cl. D21—214

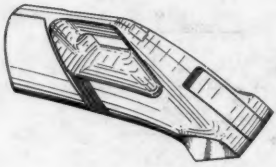


313,829
IRON GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed May 10, 1988, Ser. No. 192,121
Term of patent 14 years
U.S. Cl. D21—220

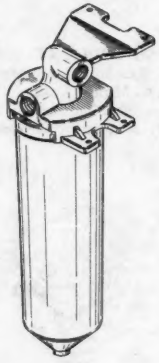


313,830
PLAY TENT
Brian E. Foust, 263 Yosemite Cir., #15, Golden Valley, Minn. 55422
Filed Jan. 11, 1988, Ser. No. 142,411
Term of patent 14 years
U.S. Cl. D21—253

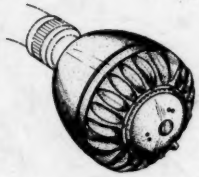
313,831
VACUUM CLEANER
Paul Gildersleeve, Ridgefield, Conn., assignor to Black & Decker, Inc., Newark, Del.
Filed Jul. 11, 1988, Ser. No. 216,990
Term of patent 14 years
U.S. Cl. D32—18



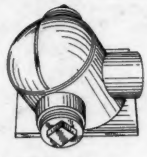
313,832
COMBINED QUICK-CHANGE FILTER CARTRIDGE AND HEAD
Raymond M. Petrucci, Middlebury; Bruce G. Taylor, Kensington; Edward C. Giordano, Manchester, all of Conn.; James M. Padilla, Covina Heights, and Carl Palmer, La Habra Heights, both of Calif., assignors to Cuno Incorporated, Meriden, Conn.
Division of Ser. No. 128,504, Dec. 3, 1987, Pat. No. D. 306,754, which is a continuation-in-part of Ser. No. 822,548, Jan. 27, 1986, abandoned. This application Sep. 26, 1989, Ser. No. 412,875
Term of patent 14 years
U.S. Cl. D23—209



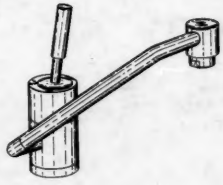
313,833
SHOWER HEAD
Constantin Presman, Bat Yam, Israel, assignor to Brass-Craft Manufacturing Company, Southfield, Mich.
Filed Mar. 7, 1988, Ser. No. 165,202
Term of patent 14 years
U.S. Cl. D23—213



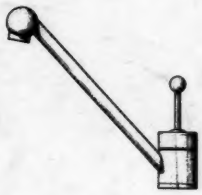
313,834
SPRINKLER FOR FIGHTING PETROLEUM FIRES AND THE LIKE
David W. Owens, and Jack E. Propp, both of Casper, Wyo., assignors to Amoco Corporation, Chicago, Ill.
Filed May 21, 1987, Ser. No. 53,416
Term of patent 14 years
U.S. Cl. D23—214

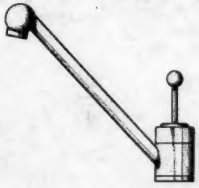


313,835
FAUCET
Alfons Knapp, Biberach, Fed. Rep. of Germany, assignor to Masco Corporation, Taylor, Mich.
Filed Jun. 22, 1987, Ser. No. 64,926
Term of patent 14 years
U.S. Cl. D23—238

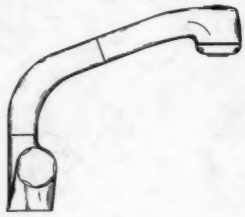


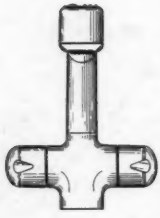
313,836
FAUCET
Alfons Knapp, Biberach, Fed. Rep. of Germany, assignor to Masco Corporation, Taylor, Mich.
Filed Dec. 14, 1987, Ser. No. 136,151
Term of patent 14 years
U.S. Cl. D23—238



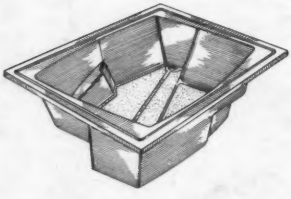


313,837
FAUCET
Wolfgang Heieck, Langenau, Fed. Rep. of Germany, assignor to Knebel & Rottger GmbH & Co., Iserlohn, Fed. Rep. of Germany
Filed May 6, 1987, Ser. No. 47,333
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1986, MR 7516
Term of patent 14 years
U.S. Cl. D23—241

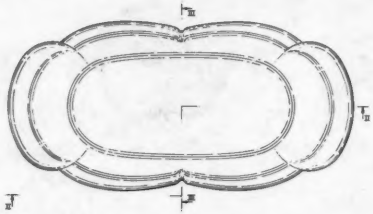




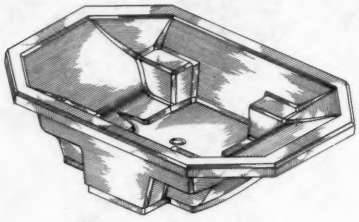
313,838
BATHTUB
Scott G. Lenahan, 20140 Delight St., Canyon Country, Calif. 91351
Filed Feb. 12, 1987, Ser. No. 13,719
Term of patent 14 years
U.S. Cl. D23—277



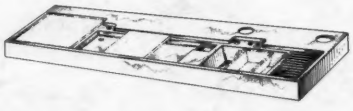
313,839
BATHTUB
Lawrence J. Dunlop, Lisburn, United Kingdom, assignor to Adamsez (N.I.) Limited, Northern Ireland
Filed Oct. 9, 1987, Ser. No. 106,701
Claims priority, application United Kingdom, Apr. 11, 1987, 1041509
Term of patent 14 years
U.S. Cl. D23—280



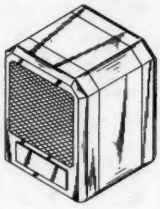
313,840
BATHTUB
George S. Gruber, 27563 Oak Spring Can Yon Rd., Canyon Country, Calif. 91351
Filed Dec. 10, 1987, Ser. No. 130,728
Term of patent 14 years
U.S. Cl. D23—280



313,841
KITCHEN WORK TABLE PLATE
Gerd Bulthaup, Aich, Fed. Rep. of Germany, assignor to Bulthaup GmbH & Co. KG, Aich, Fed. Rep. of Germany
Filed Jun. 25, 1987, Ser. No. 66,407
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1986, MR 452
Term of patent 14 years
U.S. Cl. D23—287

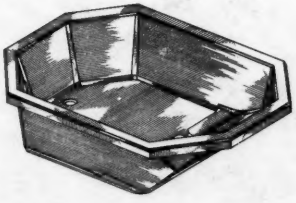


313,842
AIR HEATER
Jack Fan, Hou Li, Taiwan, assignor to Synlix Electrical Ltd, Taiwan
Filed Sep. 28, 1988, Ser. No. 250,817
Term of patent 14 years
U.S. Cl. D23—335

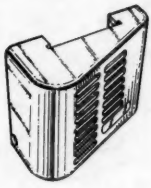


313,843
FAN HEATER
Lee Wen-Tun, No. 182, Yung Fu Road, Sec. 2, Tainan, Taiwan
Filed Mar. 18, 1988, Ser. No. 169,727
Term of patent 14 years
U.S. Cl. D23—337

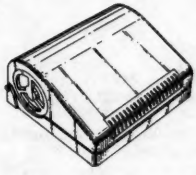
313,844
BATHTUB
George S. Gruber, 27563 Oak Spring Can Yon Rd., Canyon Country, Calif. 91351
Filed Dec. 10, 1987, Ser. No. 130,727
Term of patent 14 years
U.S. Cl. D23—281



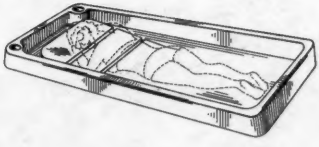
313,845
STATIC AIR FRESHENER
William E. Sullivan, Blythewood, S.C., and Richard H. Seager, Mystic, Conn., assignors to Ecolab Inc., St. Paul, Minn.
Filed Sep. 13, 1989, Ser. No. 406,741
Term of patent 14 years
U.S. Cl. D23—366



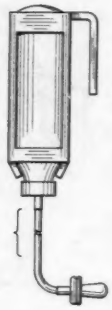
313,846
DISPENSER FOR AIR FRESHENER
William E. Sullivan, Blythewood, S.C., and Richard H. Seager, Mystic, Conn., assignors to Ecolab Inc., St. Paul, Minn.
Filed Sep. 13, 1989, Ser. No. 406,743
Term of patent 14 years
U.S. Cl. D23—366



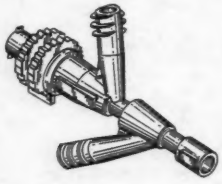
313,847
SUN BATHING TUB
Donald G. Higgins, Rte. 1, Box 475F, Myakka City, Fla. 33551
Filed May 29, 1987, Ser. No. 55,770
Term of patent 14 years
U.S. Cl. D24—39

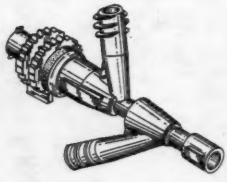


313,848
BABY BOTTLE
Peter Corso, 1737 Yorktown Ave., Titusville, Fla. 32796
Filed Jan. 31, 1989, Ser. No. 304,340
Term of patent 14 years
U.S. Cl. D24—47



313,849
MANIFOLD FOR ANGIOPLASTY BALLOON CATHETER
David B. Robinson, Chanhassen, Minn., assignor to SciMed Life Systems, Inc., Maple Grove, Minn.
Filed Mar. 24, 1988, Ser. No. 173,755
Term of patent 14 years
U.S. Cl. D24—53

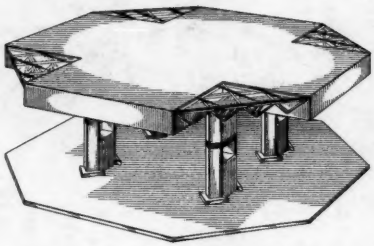




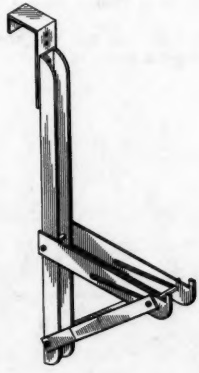
313,850
INHALATION AID
Robert E. Newell, Pinner, England, assignor to Glaxo Group Limited, London, England
Filed Jun. 3, 1988, Ser. No. 202,438
Claims priority, application United Kingdom, Dec. 4, 1987, 1046862
Term of patent 14 years
U.S. Cl. D24—62

313,851
TOY NOVELTY FIGURE
Mark Palese, 20 Brian Dr., Rochester, N.Y. 14624
Filed Jul. 27, 1987, Ser. No. 78,692
Term of patent 14 years
U.S. Cl. D21—148

313,852
AUTOMOTIVE SERVICE STATION PUMP ISLAND
Raymond Poelvoorde, New York, N.Y., assignor to Sun Refining and Marketing Company, Philadelphia, Pa.
Filed Nov. 16, 1988, Ser. No. 272,267
Term of patent 14 years
U.S. Cl. D25—56

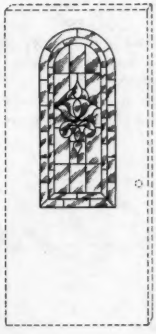


313,853
WALL JACK
Charles R. Hutchins, 5 McDaniel Pl., London, Ohio 43140
Filed Jul. 7, 1988, Ser. No. 216,237
Term of patent 14 years
U.S. Cl. D25—68



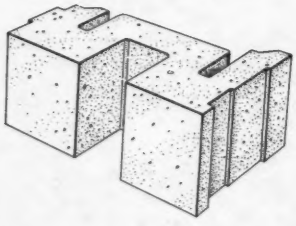
313,854
DOOR LIGHT PANEL
Roger C. Hall, Jasper, Tex., assignor to Visador Company, Jasper, Tex.
Filed Sep. 23, 1988, Ser. No. 248,207
Term of patent 14 years
U.S. Cl. D25—103

313,855
DOOR LIGHT PANEL
Roger C. Hall, Jasper, Tex., assignor to Visador Company, Jasper, Tex.
Filed Sep. 23, 1988, Ser. No. 248,212
Term of patent 14 years
U.S. Cl. D25—103

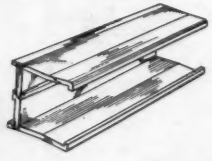


313,856
DECORATIVE GLASS PANEL
Norbert J. Guetle, Jr., Cincinnati, and B. Jeremiah Shaffer, Worthington, both of Ohio, assignors to Pease Industries, Inc., Fairfield, Ohio
Filed Jan. 30, 1989, Ser. No. 302,859
Term of patent 14 years
U.S. Cl. D25—103

313,857
COVER BLOCK FOR AN I-BEAM OR THE LIKE
Mervyn E. Gabriel, Thornhill, Canada, assignor to Evercrete Limited, Maple, Canada
Filed Jul. 18, 1988, Ser. No. 220,114
Claims priority, application Canada, Jun. 1, 1988, 01-06-88-10
Term of patent 14 years
U.S. Cl. D25—113

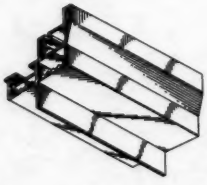


313,858
SHOWER DOOR STILE
John Whitney, Victoria, Australia, assignor to Dowell Australia Limited, Victoria, Australia
Filed Aug. 4, 1987, Ser. No. 81,171
Term of patent 14 years
U.S. Cl. D25—119

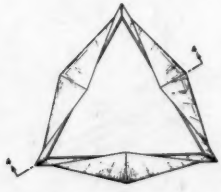


313,859
EXTRUSION FOR METALLIC FRAMEWORKS
Jose E. Martin, Ronda de Buenos Aires, 12, Puerto de Sagunto, Valencia, Spain
Filed Apr. 23, 1987, Ser. No. 41,753
Term of patent 14 years
U.S. Cl. D25—124

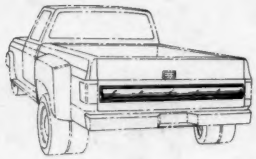
313,860
EXTRUDED MASTER FRAME WINDOW JAMB
Leon F. Slocomb, Jr., 2641 W. Robino Dr., Wilmington, Del. 19808
Filed Aug. 18, 1989, Ser. No. 395,471
Term of patent 14 years
U.S. Cl. D25—124



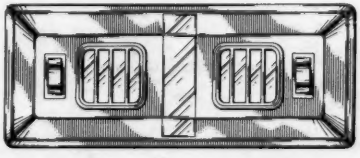
313,861
LUMINAIRE
Anthony J. Michael, 8123 Virginia Park, Centerline, Mich. 48015
Filed Nov. 28, 1988, Ser. No. 277,053
Term of patent 14 years
U.S. Cl. D26—26



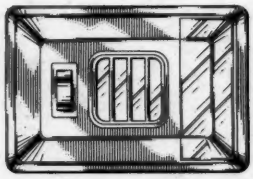
313,862
AUXILIARY TAILGATE LIGHT FOR A TRUCK OR THE LIKE
John F. Gaukler, Upland, Calif., assignor to Jodie Smith, Chino, Calif.
Filed Oct. 30, 1989, Ser. No. 429,188
Term of patent 14 years
U.S. Cl. D26—28

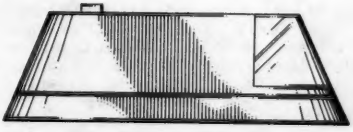


313,863
COMBINED COURTESY AND ADJUSTABLE READING LIGHT FOR VEHICLES
Anthony Macaluso, 3954 Paseo Grande, Tucson, Ariz. 85711
Filed Sep. 24, 1987, Ser. No. 100,703
Term of patent 14 years
U.S. Cl. D26—29

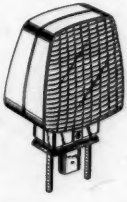


313,864
COMBINED COURTESY AND ADJUSTABLE READING LIGHT FOR VEHICLES
Anthony Macaluso, 3954 Paseo Grande, Tucson, Ariz. 85711
Filed Oct. 9, 1987, Ser. No. 106,340
The portion of the term of this patent subsequent to Jan. 15, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—29

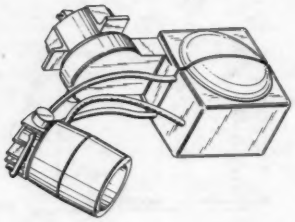




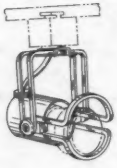
313,865
TURN SIGNAL LAMP
Don R. Armacost, Jr., Stilwell, and Joseph T. Hodges, Leawood, both of Kans., assignors to Peterson Manufacturing Company, Grandview, Mo.
Filed Dec. 21, 1988, Ser. No. 287,733
Term of patent 14 years
U.S. Cl. D26—35



313,866
TRACK LIGHT FIXTURE
Tobias Brown, Oak Park, Ill., assignor to Alkco Manufacturing Company, Franklin Park, Ill.
Filed Apr. 14, 1988, Ser. No. 182,069
Term of patent 14 years
U.S. Cl. D26—61

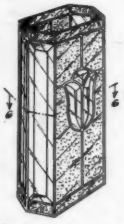


313,867
ADJUSTABLE WIREFORM LAMP HOLDER FOR TRACK LIGHTING FIXTURE
Robert S. Fremont, Deerfield, and James R. Gross, Geneva, both of Ill., assignors to Juno Lighting, Inc., Des Plaines, Ill.
Filed Dec. 12, 1988, Ser. No. 283,898
Term of patent 14 years
U.S. Cl. D26—63

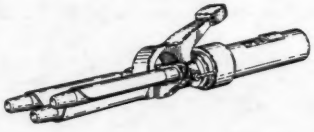


313,868
WALL LIGHT
Keen Shyu, No. 108, Sec. 3, Taichung Kang Rd., Taichung, Taiwan
Filed Jun. 30, 1989, Ser. No. 374,391
Term of patent 14 years
U.S. Cl. D26—87

313,869
LIGHT DIFFUSING ENCLOSURE FOR CANDLE, ELECTRIC LAMP, OR SIMILAR ARTICLE
Mary McKenna, P.O. Box 3381, and Gayle Cross-Combs, P.O. Box 8131, both of Incline Village, Nev. 89450
Filed Jan. 4, 1988, Ser. No. 140,415
Term of patent 14 years
U.S. Cl. D26—129



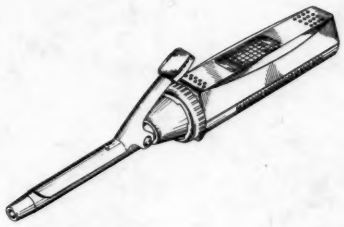
313,870
HAIR WAVING IRON
Giovanni J. A. Mastromonaco, Montreal, Canada, assignor to Giovanni Management Canada Ltd., Montreal, Canada
Filed Feb. 17, 1989, Ser. No. 312,570
Term of patent 14 years
U.S. Cl. D28—35



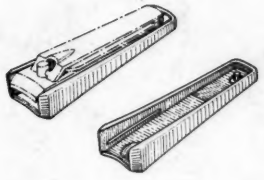
313,871
HAIR CURLING BRUSH
Robert Oberheim, Liederbach, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Apr. 25, 1989, Ser. No. 343,128
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1988, 8803140
Term of patent 14 years
U.S. Cl. D28—35

313,872
LIPSTICK CASE
Howard J. Thompson, 134 Salem St., Malden, Mass. 02148
Filed May 15, 1989, Ser. No. 351,568
Term of patent 14 years
U.S. Cl. D28—85

313,873
CURLING IRON
Michael Cafaro, Montreal, Canada, assignor to Giovanni Management Canada LTC., Montreal, Canada
Filed Feb. 14, 1989, Ser. No. 311,716
Term of patent 14 years
U.S. Cl. D28—35



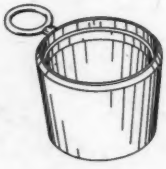
313,874
NAIL CLIPPER RETAINER
Steven Schulz, 115 Clinton St., Santa Cruz, Calif. 95062
Filed Jun. 28, 1989, Ser. No. 372,513
Term of patent 14 years
U.S. Cl. D28—60



313,875
DENTAL FLOSS HOLDER
Kuo-Chun Chen, 1755 Hammond Ct., Bloomfield Hills, Mich. 48013
Filed Oct. 13, 1987, Ser. No. 107,540
Term of patent 14 years
U.S. Cl. D28—64

313,876
LIPSTICK CASE
Stanley Acker, 60 Cedar Hill Ave., Nyack, N.Y. 10960
Filed Aug. 3, 1987, Ser. No. 80,587
Term of patent 14 years
U.S. Cl. D28—85

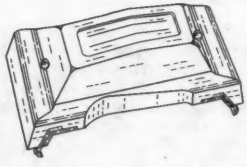
313,877
FIRST STAGE SCUBA REGULATOR BOOT
Dean R. Garraffa, Garden Grove, Calif., assignor to Under Sea Industries, Inc., Rancho Dominguez, Calif.
Filed Feb. 22, 1988, Ser. No. 159,030
Term of patent 14 years
U.S. Cl. D29—6

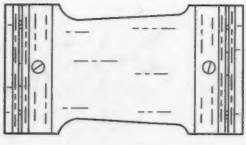


313,878
CART
Isaac Rinkewich, Hightstown, N.J., assignor to Poly Maid-Cart Corp., Inc., Hightstown, N.J.
Filed Oct. 19, 1988, Ser. No. 266,921
Term of patent 14 years
U.S. Cl. D34—21

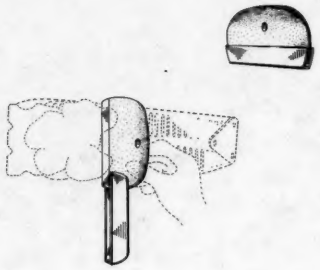
313,879
LIQUID APPLYING CLEANER
Takeo Ito, Tokyo, Japan, assignor to Kabushiki Kaisha Hoky, Japan
Filed Apr. 19, 1989, Ser. No. 340,564
Claims priority, application Japan, Oct. 31, 1988, 63-42778
Term of patent 14 years
U.S. Cl. D32—22

313,880
SCRAPER
Peter L. Magnasco, 3052 Colonial Way, San Jose, Calif. 95128
Filed Jan. 7, 1987, Ser. No. 1,103
Term of patent 14 years
U.S. Cl. D32—46

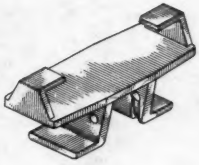




313,881
MUD, SNOW AND ICE SCRAPER WITH RETRACTABLE COVER
E. Renee Nielson, 322 South, 2000 West, Syracuse, Utah 84041
Filed Aug. 25, 1989, Ser. No. 400,032
Term of patent 14 years
U.S. Cl. D32—46



313,882
RUBBER GRIPPER HOLD FOR A CONVEYOR CHAIN
Nick Kanian, 3200 Bandini Blvd., Los Angeles, Calif. 90023
Filed Feb. 12, 1987, Ser. No. 13,921
Term of patent 14 years
U.S. Cl. D34—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF JANUARY, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.M. International, Inc.: *See*—
Montgomery, Robert M.; Dessert, Robert A.; and Punater, Dinesh G., 4,984,458, Cl. 73-159.000.

A. O. Smith Corporation: *See*—
Pottebaum, Joseph R., 4,984,981, Cl. 431-80.000.

A/S Ferrosan: *See*—
Drejer, Jorgen; and Jakobsen, Palle, 4,985,446, Cl. 514-321.000.

A/S Phonix Contractors: *See*—
S gaard, Dennis, 4,985,083, Cl. 134-26.000.

A. Y. McDonald Mfg. Co.: *See*—
Daghe, Joe L.; Eckel, John D.; and Heidbrier, Warren G., 4,984,767, Cl. 251-297.000.

AB Profor: *See*—
Andersson, Sven-Arne; and Sundberg, Anders, 4,984,601, Cl. 137-486.000.

AB Volvo Penta: *See*—
Nestvall, Per; and Rodskier, Christian, 4,985,005, Cl. 440-2000.000.

ABB Air Preheater, Inc.: *See*—
Miller, Norman P.; and Eaton, Leo W., 4,984,621, Cl. 165-10.000.

Abe, Akiharu: *See*—
Asada, Toshiyuki; Higashiyama, Yasuhiko; Nakawaki, Yasunori; Suzuki, Toshitake; Abe, Akiharu; and Moriguchi, Naoki, 4,985,011, Cl. 475-278.000.

Abe, Hiroaki; and Toyoda, Shuhei, to NGK Insulators, Ltd. Optical component and magnetic-field sensor using superposed single crystal elements having different optical properties. 4,984,875, Cl. 350-377.000.

Abe, Hiroyuki: *See*—
Yamada, Wataru; Kido, Yukio; Abe, Hiroyuki; Minami, Shunji; Katoh, Shigeru; and Yano, Junro, 4,985,878, Cl. 368-88.000.

Abe, Takashi; and Hayashi, Eiji, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Perfluoro(dialkylaminopropene) derivatives. 4,985,556, Cl. 540-484.000.

Abe, Teruyoshi: *See*—
Ogura, Kuniaki; Oota, Junichi; Abe, Teruyoshi; and Takajo, Shigeaki, 4,985,309, Cl. 428-570.000.

Abe, Tetsuaki: *See*—
Uchida, Hiroyasu; Abe, Tetsuaki; and Ishizawa, Hiroaki, 4,984,628, Cl. 165-26.000.

Abe, Yoshio: *See*—
Yasumoto, Yoshio; Kageyama, Sadashi; Inoue, Shuji; Abe, Yoshio; and Uwabata, Hideyo, 4,985,769, Cl. 358-141.000.

Abou-Gharbia, Magid A.: *See*—
Sabb, Annmarie L.; Abou-Gharbia, Magid A.; and Dionne, Gervais, 4,985,560, Cl. 544-115.000.

Achiwa, Kazuo; and Takeda, Hideo, to Kazuo Achiwa; and Fuji Yakuhin Kogyo Kabushiki Kaisha. Chiral phosphinopyrrolidine compounds and their use for asymmetric synthesis of optically active compounds. 4,985,567, Cl. 548-412.000.

Achleitner, August, to Dr. Ing. h.c.F. Porsche AG. Wheel suspension. 4,984,818, Cl. 280-701.000.

Actar Airforce, Inc.: *See*—
Brault, Richard; Croteau, Dianne; and Vinden, Jonathan, 4,984,987, Cl. 434-265.000.

Acushnet Company: *See*—
Llort, Francisco M.; and Jerome, Manuel R., Jr., 4,984,803, Cl. 273-235.00R.

Adachi, Ginya; Imanaka, Nobuhito; Aono, Hiromichi; Sugimoto, Eisuke; Sadaoka, Yoshihiko; Yasuda, Naoshi; Hara, Takeo; and Nagata, Masaki, to Japan Synthetic Rubber Co., Ltd. Lithium ion-conductive solid electrolyte containing lithium titanium phosphate. 4,985,317, Cl. 429-191.000.

Adachi, Masao: *See*—
Shioya, Makoto; and Adachi, Masao, 4,985,847, Cl. 364-516.000.

Adams, David G., to Spectradyne, Inc. Current detection circuit and method. 4,985,761, Cl. 358-84.000.

Adams, Graham R.: *See*—
Pfaffmann, George D.; Kubis, Charles S.; Currie, John P.; Balzer, Norbert R.; Walter, John; and Adams, Graham R., 4,984,414, Cl. 53-478.000.

Addeo, Antonio; Bonvini, Alberto; Reggiani, Romano; and Vezzoli, Annibale, to Centro Sviluppo Settori Impiego S.r.l. Process for preparing heat-insulating structural elements, and products obtained thereby. 4,985,303, Cl. 428-36.500.

Adeka Argus Chemical Co., Ltd.: *See*—
Kakumaru, Hajime; Minami, Yoshitaka; Kubota, Naohiro; and Mashimo, Shinya, 4,985,564, Cl. 546-104.000.

Advanced Fuel Research, Inc.: *See*—
Morrison, Philip W., Jr.; Solomon, Peter R.; and Hamblen, David G., 4,985,858, Cl. 364-557.000.

Advanced Micro Devices, Inc.: *See*—
Kubinec, James J., 4,985,905, Cl. 377-79.000.

Advantest Corporation: *See*—
Hashimoto, Yoshihiro; Yamazaki, Shoji; and Katoh, Shunsuke, 4,985,672, Cl. 324-158.00R.

Aebli, Jost: *See*—
Hanselmann, Daniel; Schlepfer, Walter; and Aebli, Jost, 4,984,336, Cl. 19-80.00R.

Aerospatiale Societe Nationale Industrielle: *See*—
Hellard, Guy; and Bedes, Amour, 4,985,801, Cl. 361-215.000.

Affeldt, Roger D.: *See*—
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AG Communication Systems Corporation: *See*—
Belanger, Thomas D., Jr., 4,985,748, Cl. 357-69.000.

Aga, Keigo: *See*—
Sekiguchi, Takeshi; Shiga, Nobuo; and Aga, Keigo, 4,985,597, Cl. 174-52.400.

Agarwala, Birendra N.; Beckman, Keith F.; Cooper-Joselow, Alice H.; Narayan, Chandrasekhar; Purushothaman, Sampath; and Ray, Sudipta K., to International Business Machines Corp. Multilayered metallurgical structure for an electronic component. 4,985,310, Cl. 428-620.000.

Agazzi, Steven J.: *See*—
Graf, Peter E.; Agazzi, Steven J.; and Vanderzanden, Eugene J., 4,985,079, Cl. 106-502.000.

Agency of Industrial Science & Technology: *See*—
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Enomoto, Yuji, 4,984,453, Cl. 73-81.000.
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Nagatsuka, Yoshihiro; and Fukuta, Kenji, 4,984,340, Cl. 28-104.000.
Sugie, Kiyoshi, 4,985,053, Cl. 55-158.000.

Agency of Industrial Science and Technology, Ministry of International Trade and Industry: *See*—
Ohuchi, Kiyoyuki; Nakazawa, Yoshinori; and Matsuno, Kenichi, 4,984,445, Cl. 72-360.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Matejec, Reinhart; Odenwalder, Heinrich; Ohlschlager, Hans; and Wolff, Erich, 4,985,351, Cl. 430-598.000.

Agfa-Gevaert Aktiengessellschaft: *See*—
Hoffacker, Franz; Kovacic, Guido; and Luhrig, Hermann, 4,984,751, Cl. 242-74.000.

Agfa-Gevaert, N.V.: *See*—
Vanmaele, Luc J.; and Van de Sande, Christian C., 4,985,395, Cl. 503-227.000.

Ahlgren, William L., to Santa Barbara Research Center. Elemental mercury source for metal-organic chemical vapor deposition. 4,985,281, Cl. 427-248.100.

Ahonen, Heikki. Method and apparatus for cleaning freight containers as well as for treating and circulating the fluids used. 4,984,593, Cl. 134-13.000.

Ahonen, Heikki; Kenakkala, Timo; and Kokkonen, Pertti, to Oy Iampella AB. Method of producing cement or concrete. 4,985,081, Cl. 106-772.000.

Aichi Steel Works, Limited: *See*—
Kaede, Hiroshi; Koike, Tadahiro; Kato, Shinji; Maeda, Yorishige; Fuwa, Yoshio; Sugimoto, Shigetoshi; Aoyagi, Hikaru; and Shibata, Shinzi, 4,985,092, Cl. 148-326.000.

Aida, Kikuo: *See*—
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Aiga, Masayuki: *See*—
Ueno, Katsunori; Aiga, Masayuki; and Kuroda, Masafumi, 4,985,802, Cl. 361-302.000.

Air Industrie Systemes: *See*—
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Air Products and Chemicals, Inc.: *See*—
Burgoyne, William F., Jr.; and Dixon, Dale D., 4,985,159, Cl. 252-50.000.

Airfoil Textron Inc.: *See*—
Spain, Raymond G.; and Bailey, Carlos, 4,984,502, Cl. 87-8.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Momose, Yutaka; Watanabe, Tetsumi; Hiraiwa, Kouzi; and Mizuno, Tomokimi, 4,984,428, Cl. 60-517.000.
Naruse, Yoshihiro; Kato, Hideharu; and Iwata, Yoshifumi, 4,985,919, Cl. 380-18.000.
Sawaoka, Akira; Matsuda, Ryuichi; and Kondo, Tadashi, 4,985,401, Cl. 505-1.000.
Wada, Yoshiaki; Itaba, Tunesaku; Kasahara, Koichiro; Mizuno, Tomokimi; and Momose, Yutaka, 4,984,812, Cl. 277-153.000.

Ajima, Masayoshi: *See*—
Irube, Makoto; Nakajima, Junjiro; Umehara, Hajime; Tada, Nobuo; and Ajima, Masayoshi, 4,985,199, Cl. 376-442.000.

Ajinomoto Co., Inc.: *See—*
Matsuno, Kazuhiro; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, 4,985,237, Cl. 424-59.000.

Akagi, Nobuo: *See—*
Hayakawa, Kunio; Furuya, Hiromi; Shimada, Hisanori; Nakata, Masahiro; Kodera, Kaoru; Oohara, Kouji; and Akagi, Nobuo, 4,985,345, Cl. 430-335.000.

Akahane, Atsushi: *See—*
Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, 4,985,444, Cl. 514-300.000.

Akashi, Shunji, to Yoshida Kogyo K.K. Ornamental pull tab for slide fastener sliders. 4,984,338, Cl. 24-431.000.

Akatsu, Toshio: *See—*
Miyazaki, Chuuichi; Akatsu, Toshio; and Mori, Sadao, 4,984,891, Cl. 356-358.000.

Akazaki, Shuichi: *See—*
Yano, Shinji; Kawamata, Akira; Minematsu, Yoshihiro; Akazaki, Shuichi; Zama, Mitsuko; Imokawa, Genji; Takaishi, Naotake; Ohtomo, Tsuyoshi; and Komori, Takashi, 4,985,547, Cl. 536-4.100.

Akeel, Hadi A.; and Malarz, Antoni J., to GMF Robotics Corporation. Electric robot for use in a hazardous location. 4,984,745, Cl. 239-587.000.

Akimoto, Kazuo; Hirai, Toshiaki; and Tanikawa, Miyoshi, to Seikosha Co., Ltd. Automatic focus/exposure operation apparatus for camera. 4,985,724, Cl. 354-400.000.

Akimoto, Masami: *See—*
Ushijima, Mitsuru; and Akimoto, Masami, 4,985,722, Cl. 354-319.000.

Akiyama, Setsuo; Monobe, Hisanobu; Naito, Kazuo; Honda, Toshio; and Tanaka, Kazuo, to Bridgestone Corporation. Crystalline N-methoxymethylated nylon and nylon composition. 4,985,510, Cl. 525-427.000.

Akiyama, Shunichi; Sato, Norio; Suzuki, Kenichirou; Yoshimoto, Taisuke; and Nakasho, Hideaki, to Toyota Jidosha Kabushiki Kaisha; Kabushiki Kaisha Toyota Chuo Kenkyusho; and Trinity Industrial Corporation. Exhaust gas processing apparatus for paint drying oven. 4,985,211, Cl. 422-171.000.

Akiyoshi, Rika: *See—*
Izumi, Zenichiro; Kurosawa, Shigeru; and Akiyoshi, Rika, 4,985,502, Cl. 525-194.000.

Aktiebolaget Electrolux: *See—*
Bennet, Tom J., 4,984,559, Cl. 126-43.000.
Westfelt, Jan A. N., 4,984,596, Cl. 134-58.0DL.

Akzo N.V.: *See—*
Gemeinhardt, Hermann; Hoff, Elmar; and Schurmann, Erich, 4,984,630, Cl. 165-173.000.

Albanese, Joseph. Combination utensil. 4,984,367, Cl. 30-147.000.

Albarda, Scato; Frank, Helge; and Marcoll, Joachim, to Dragerwerk Aktiengesellschaft. Material having a predeterminable magnetic susceptibility. 4,985,165, Cl. 252-62.540.

Albrethsen, Adrian E.: *See—*
El Tawil, Mamdouh M.; and Albrethsen, Adrian E., 4,985,216, Cl. 423-29.000.

Alcatel Cit: *See—*
Burger, Heinz D., 4,984,450, Cl. 73-40.700.

Alco Standard Corporation: *See—*
Haynes, Joel E., 4,984,461, Cl. 73-249.000.

Aldrich, Gary R.; Brown, George T.; Millis, David B.; and Nowak, Ronald P., to International Business Machines Corp. Method for producing installation instructions for three dimensional assemblies. 4,985,855, Cl. 364-522.000.

Alexander, Thomas R.; Evangelista, Donato D.; and Leo, Michael F., to Xerox Corporation. Sheet feeder with skew control. 4,984,778, Cl. 271-117.000.

Alexander, William; Anderson, Mark; and Regan, Barbara R., to American Colloid Company. Process for preparing water-absorbing resins. 4,985,518, Cl. 526-240.000.

Alexandrides, George: *See—*
Walsdorf, Neill B.; and Alexandrides, George, 4,985,593, Cl. 562-584.000.

Alfa Lancia S.p.A.: *See—*
Villa, Ezio; Biazzi, Giuseppe; and Guelfi, Giorgio, 4,984,843, Cl. 296-213.000.
Visconti, Marco, 4,984,815, Cl. 280-91.000.

Alfred, Steven R. Board game. 4,984,806, Cl. 273-255.000.

Allen Organ Company: *See—*
Beacham, Dwight A.; Woron, Robert P.; and Whitefield, John T., 4,984,496, Cl. 84-625.000.

Allen, Steven R., to Du Pont de Nemours, E. I., and Company. Aramid yarn process. 4,985,193, Cl. 264-184.000.

Aller, Harold E.: *See—*
Hsu, Adam C.; and Aller, Harold E., 4,985,461, Cl. 514-615.000.

Allgemeine Baugesellschaft-A.Porr Aktiengesellschaft: *See—*
Jung, Fritz, 4,985,080, Cl. 106-672.000.

Alliance Pharmaceutical Corp.: *See—*
Charpiot, Brigitte; Greiner, Jacques; Le Blanc, Maurice; Manfredi, Alexandre; Riess, Jean; and Zarif, Leila, 4,985,550, Cl. 536-18.400.

Allis, David, to Zebco Corporation. Anti-reverse actuator for a spinning reel. 4,984,665, Cl. 192-7.000.

Allport, Davies. Drip irrigation hose. 4,984,739, Cl. 239-193.000.

Allyssa Industries, Inc.: *See—*
White, Judith E., 4,984,535, Cl. 119-17.000.

Alplast S.p.A.: *See—*
Margaria, Mario, 4,984,701, Cl. 215-256.000.

Altherr, Russell G., to Amsted Industries Incorporated. Railway coupler head strengthened at horn line. 4,984,696, Cl. 213-151.000.

Altimier, David F., Jr.; and McIntosh, B. J. Personal artificial loop (p.a.l.). 4,985,917, Cl. 379-32.000.

Alum Rock Technology: *See—*
Potter, Robert I., 4,984,600, Cl. 137-82.000.

ALZA Corporation: *See—*
Theeuwes, Felix; and Yum, Su I., 4,985,016, Cl. 604-85.000.
Theeuwes, Felix, 4,985,017, Cl. 604-92.000.

Amano Corporation: *See—*
Komine, Hidemi; and Miyagi, Yoshio, 4,985,713, Cl. 346-82.000.

Amano, Kozo; and Matsubara, Yoshihiro, to NGK Spark Plug Co., Ltd. Temperature and pressure detecting type spark plug. 4,984,905, Cl. 374-143.000.

Amano, Tadashi; and Hoshida, Shigehiro, to Shin-Etsu Chemical Co., Ltd. Process of polymerizing vinyl chloride with post-heating of charging passage. 4,985,524, Cl. 526-344.200.

Amble, Charles S.: *See—*
Bajpai, Atul; Marczewski, Richard W.; Marek, Melissa M.; Shrivastava, Anil B.; Amble, Charles S.; Joyce, Robert H.; Kishore, Nanda; and Ollanik, Steven J., 4,985,857, Cl. 364-551.010.

Ambrosini, Leonardo: *See—*
Giobbio, Vincenzo; and Ambrosini, Leonardo, 4,985,549, Cl. 536-13.800.

American Colloid Company: *See—*
Alexander, William; Anderson, Mark; and Regan, Barbara R., 4,985,518, Cl. 526-240.000.
Hughes, John, 4,985,061, Cl. 71-68.000.
Hughes, John, 4,985,062, Cl. 71-77.000.

American Home Products Corporation: *See—*
Sabb, Annmarie L.; Abou-Gharbia, Magid A.; and Dionne, Gervais, 4,985,560, Cl. 544-115.000.

American Standard Inc.: *See—*
Basile, Peter A.; Madan, Ashvani K.; Snyder, Fred E.; and Stillman, Harold M., 4,984,311, Cl. 4-354.000.

AMP Incorporated: *See—*
Assal, Jerome V., 4,984,705, Cl. 220-3.900.
Beamenderfer, Robert E.; Buchheister, Raymond R., Jr.; Ellis, John R.; Miller, Charles A.; Moist, Stanford C., Jr.; and Zelko, William E., 4,984,992, Cl. 439-108.000.
Brownlie, Alan W.; and Lawhead, Jack W., 4,984,982, Cl. 439-131.000.
Clark, Thomas C., 4,984,359, Cl. 29-879.000.
Duncan, Frank L.; Hughes, Donald W. K.; and Ward, Bobby G., 4,984,998, Cl. 439-352.000.
Korsunsky, Iosif; Bateman, Steven P.; and Grabbe, Dimitry G., 4,984,997, Cl. 439-331.000.
Mummey, Dale B.; and Yohn, Brent D., 4,984,383, Cl. 439-259.000.
ten Berge, Eduardus F. A., 4,984,868, Cl. 350-96.210.
Watanabe, Tetsuya; Sato, Yoshio; Nakamura, Tsutomu; Kumagai, Naoki; and Kamono, Takashi, 4,984,996, Cl. 439-326.000.

Ampex Corporation: *See—*
Baranski, Antoni S., 4,984,897, Cl. 360-92.000.
Gooch, Beverley R., 4,985,795, Cl. 360-115.000.

Amsted Industries Incorporated: *See—*
Altherr, Russell G., 4,984,696, Cl. 213-151.000.

Analog Devices, Incorporated: *See—*
Lapham, Jerome F.; and Brokaw, Adrian P., 4,985,739, Cl. 357-22.000.

Anders, Helmner, to Scandinavian Bellyloading Company Aktiebolag. Arrangement for loading a cargo compartment, in particular that of an aircraft, with piece goods. 4,984,756, Cl. 244-137.100.

Anderson, Albert G.; Hertler, Walter R.; Wheland, Robert C.; and Chen, Yuan Yu G., to Du Pont de Nemours, E. I., and Company. Resist material with carbazole diazonium salt acid generator and process for use. 4,985,332, Cl. 430-176.000.

Anderson, Carl. Scaffold safety system. 4,984,654, Cl. 182-179.000.

Anderson, Kurt M., to Conner Peripherals, Inc. Voice coil activated disk drive parking device with magnetic bias. 4,985,793, Cl. 360-105.000.

Anderson, Mark: *See—*
Alexander, William; Anderson, Mark; and Regan, Barbara R., 4,985,518, Cl. 526-240.000.

Anderson, Rodney D. Body-motion activated crib mobile. 4,984,380, Cl. 40-455.000.

Andersson, Sven-Arne; and Sundberg, Anders, to AB Profor. Unit apt to act upon the flow. 4,984,601, Cl. 137-486.000.

Angeion Corporation: *See—*
Isner, Jeffrey M.; and Clarke, Richard, 4,985,028, Cl. 606-15.000.

Angeles, Rosalie M.: *See—*
Freeman, David H.; Angeles, Rosalie M.; and Keller, Suzanne, 4,985,143, Cl. 210-198.200.

Angelucci, Francesco: *See—*
Caruso, Michele; Suarato, Antonino; Angelucci, Francesco; and Arcamone, Federico, 4,985,548, Cl. 536-6.400.

Anglin, Noah L.: *See—*
Cadwell, Peter F.; and Anglin, Noah L., 4,984,706, Cl. 220-334.000.

Anheuser-Busch Companies, Inc.: *See—*
Hwang, David; Lev-Ran, Arye; and Barseghian, Ken, deceased, 4,985,439, Cl. 514-312.000.

Annett, Martin F.; France, Barry; and Stanford, Tania, to Fosroc International Limited. Grouting method and apparatus. 4,984,933, Cl. 405-150.000.

Anritsu Corporation: *See—*
Horiuti, Masao; Kodama, Shunichi; and Kuroda, Kenji, 4,984,855, Cl. 350-1.100.

ANT Nachrichtentechnik GmbH: *See—*
Heichler, Johannes, 4,985,903, Cl. 375-36.000.
Antberg, Martin: *See—*
Rohrmann, Jurgen; and Antberg, Martin, 4,985,576, Cl. 556-435.000.
Antes, Gregor; and Saxer, Christian, to LGZ Landis & Gyr Zug AG. Document with an optical diffraction safety element. 4,984,824, Cl. 283-91.000.
Aoki, Yumiko: *See—*
Sunahara, Kazuo; Ichimatsu, Tsuneo; and Aoki, Yumiko, 4,985,376, Cl. 501-22.000.
Aono, Hiromichi: *See—*
Adachi, Ginya; Imanaka, Nobuhito; Aono, Hiromichi; Sugimoto, Eisuke; Sadaoka, Yoshihiko; Yasuda, Naoshi; Hara, Takeo; and Nagata, Masaki, 4,985,317, Cl. 429-191.000.
Aosai, Fumito; Fukushima, Hiroshi; and Hado, Hisako, to Mitsubishi Rayon Company, Ltd. Actinic ray curable composition for casting polymerization and casting polymerization molded products. 4,985,472, Cl. 522-64.000.
Aoyagi, Hikaru: *See—*
Kaede, Hiroshi; Koike, Tadahiro; Kato, Shinji; Maeda, Yorishige; Fuwa, Yoshio; Sugimoto, Shigetoshi; Aoyagi, Hikaru; and Shibata, Shinzi, 4,985,092, Cl. 148-326.000.
Aoyama, Hirokazu: *See—*
Ohmure, Yukio; Kashiwagi, Hiroshi; Fujiwara, Katsuki; Tsuchiya, Tatsumi; and Aoyama, Hirokazu, 4,985,168, Cl. 252-67.000.
Appleton Mills: *See—*
Gulya, Thomas G.; Schultz, Gary V.; and Arnold, Ronald A., 4,985,121, Cl. 162-352.000.
APR Composants: *See—*
De Mari, Daniel, 4,985,807, Cl. 361-405.000.
Aquatic Amusement Associated, Ltd.: *See—*
Ellis, Herbert S., 4,985,007, Cl. 441-133.000.
Arai, Kazuo; Ota, Kiyoshi; and Wakiyama, Kouji, to Matsushita Electric Industrial Co., Ltd. Apparatus for retrieving information previously recorded on recording tape irrespective of tape speed. 4,985,786, Cl. 360-70.000.
Arai, Masaru; and Saita, Itsuro, to Nippon Wiperblade Co., Ltd. Windshield wiper. 4,984,325, Cl. 15-250.200.
Arakawa, Masayasu: *See—*
Ohta, Yoshimasa; and Arakawa, Masayasu, 4,984,349, Cl. 29-430.000.
Araki, Daisuke: *See—*
Sekine, Kunio; Araki, Daisuke; and Suzuki, Yoshiki, 4,985,242, Cl. 424-85.400.
Aramaki, Jun: *See—*
Morishita, Hiroaki; Aramaki, Jun; and Tomisawa, Masao, 4,985,608, Cl. 219-69.120.
Arashiro, Yusuke: *See—*
Nishio, Takeyoshi; Yamauchi, Shinichi; Arashiro, Yusuke; Ohno, Kenyu; Yokoyama, Masuzo; Nakano, Hiroshi; Ohmori, Hiroshi; Mayumi, Junji; and Kihira, Michiharu, 4,985,495, Cl. 525-68.000.
Arata, Masami: *See—*
Sakashita, Takeshi; Arata, Masami; and Yamamoto, Takashi, 4,985,516, Cl. 526-196.000.
Arcamone, Federico: *See—*
Caruso, Michele; Suarato, Antonino; Angelucci, Francesco; and Arcamone, Federico, 4,985,548, Cl. 536-6.400.
Archibald, John L.; and Ward, Terence J., to John Wyeth & Brother, Limited. Pyridyl-and/or pyridoyl-(piperid-4-yl) ureas and analogues thereof. 4,985,438, Cl. 514-307.000.
Arcoleo, Katherine M.: *See—*
Tucker, Willy L.; and Arcoleo, Katherine M., 4,984,995, Cl. 439-321.000.
Arcs nee Trischler, Zsuzsanna: *See—*
Kreidl, Janos; Turcsanyi, Peter; Arcs nee Trischler, Zsuzsanna; Stefko, Bela; Meszaros nee Brill, Judit M.; Deutsch nee Juhasz, Ida; Szilbereky, Jeno ; Csizer, Eva; and Vezer, Szilard, 4,985,463, Cl. 514-646.000.
Arend, Gunter: *See—*
Heinz, Hans-Detlef; Hansel, Eduard; Meyer, Rolf-Volker; and Arend, Gunter, 4,985,534, Cl. 528-272.000.
Arends, Arend; R.: *See—*
Breider, Jacob; and Arends, Arend; R., 4,985,692, Cl. 340-407.000.
Ariga, Masahiro; Takise, Saburou; and Fujii, Aturo, to Hino Judosha Kogyo Kabushiki Kaisha. Automatic air bleeding device for fuel feed system of diesel engine. 4,984,554, Cl. 123-516.000.
Arimoto, Shinobu: *See—*
Maeshima, Katsuyoshi; Takeda, Atsushi; Arimoto, Shinobu; and Hasegawa, Shizuo, 4,985,760, Cl. 358-80.000.
Arita, Yutaka: *See—*
Okihara, Yoshihiko; and Arita, Yutaka, 4,985,644, Cl. 307-443.000.
Ariyama, Kenzo: *See—*
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Tsuruoka, Ichiro; Takenouchi, Hiroaki; and Echigo, Katsuhiro, 4,985,733, Cl. 355-282.000.
Arizona Board of Regents: *See—*
Pettit, George R., 4,985,436, Cl. 514-287.000.
Arlt, Dieter: *See—*
Hildebrand, Heinz; Zitzmann, Werner; Arlt, Dieter; and Kolbl, Geinz, 4,985,364, Cl. 435-254.000.
Sommer, Herbert; Arlt, Dieter; Hartwig, Jurgen; Homeyer, Bernhard; and Matthaei, Hans-Detlef, 4,985,415, Cl. 514-118.000.
Arminjon, Francois: *See—*
Quentin-Millet, Marie-Jose B.; and Arminjon, Francois, 4,985,144, Cl. 210-198.200.
Arnold, Ben A. Calibration phantom for computer tomography system. 4,985,906, Cl. 378-18.000.
Arnold, Ronald A.: *See—*
Gulya, Thomas G.; Schultz, Gary V.; and Arnold, Ronald A., 4,985,121, Cl. 162-352.000.
Aronowitz, Sheldon; Forsythe, Donald D.; Walker, George P.; and Gadepally, Bhaskar V. S., to National Semiconductor. MOS memory cell with exponentially-profiled doping and offset floating gate tunnel oxidation. 4,985,717, Cl. 357-23.500.
Arques, Marc, to Thomson-CSF. Photosensitive matrix with two diodes of the same bias and one capacitor per photosensitive dot. 4,985,619, Cl. 250-208.100.
Arretz, Emmanuel; Auge, Patrick; Mirassou, Alfred; and Landoussy, Claude, to Societe Nationale Elf Aquitaine (Production). Process for the preparation of mercaptoalcohols. 4,985,586, Cl. 560-18.000.
Arsenault, Gilles J.: *See—*
Bradford, William G.; Arsenault, Gilles J.; and Marshall, Alexander J., 4,985,540, Cl. 528-482.000.
Asada, Toshiyuki; Higashiyama, Yasuhiko; Nakawaki, Yasunori; Suzuki, Toshitake; Abe, Akiharu; and Moriguchi, Naoki, to Toyota Jidosha Kabushiki Kaisha. Automatic transmission. 4,985,011, Cl. 475-278.000.
Asahi Breweries, Ltd.: *See—*
Kurita, Akitsugu; Takezawa, Yoshiaki; Saitoh, Nobuhiro; Shimada, Takehisa; and Takemoto, Hideaki, 4,985,286, Cl. 428-34.700.
Asahi Glass Company Ltd.: *See—*
Ishikawa, Takamichi; Nomura, Masumi; and Takeuchi, Masuho, 4,985,190, Cl. 264-122.000.
Kumai, Seisaku; and Yokokouji, Osamu, 4,985,588, Cl. 560-103.000.
Sunahara, Kazuo; Ichimatsu, Tsuneo; and Aoki, Yumiko, 4,985,376, Cl. 501-22.000.
Tanaka, Chikao; Ito, Setsuro; Nakao, Yasumasa; and Maeda, Kei, 4,985,375, Cl. 501-5.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Hayashi, Kenichi; and Matsuoka, Yoshito, 4,985,520, Cl. 526-254.000.
Ishio, Tadashi; and Matsumura, Daisuke, 4,985,188, Cl. 264-22.000.
Asahi Kogaku Kogyo Kabushiki Kaishi: *See—*
Ito, Takayuki, 4,984,877, Cl. 350-423.000.
Asahi, Koichi: *See—*
Ishii, Tohru; Asahi, Koichi; and Yamaguchi, Masahisa, 4,984,823, Cl. 283-81.000.
Asahi Medical Co., Ltd.: *See—*
Kuroda, Toru; and Nishimura, Takao, 4,985,153, Cl. 210-782.000.
Asahina, Hiroshi, to Kabushiki Kaisha Toshiba. Digital fluorography apparatus. 4,985,908, Cl. 378-99.000.
Asahina, Michio, to Seiko Epson Corporation. Semiconductor device and method of production. 4,985,746, Cl. 357-67.000.
Asai, Keiichi: *See—*
Ogawa, Fumihiko; Hori, Kazunobu; Asai, Keiichi; and Watanabe, Tomoyoshi, 4,984,842, Cl. 296-155.000.
Asakawa, Naoki: *See—*
Kakimoto, Fumio; Asakawa, Naoki; Ishibashi, Yasuo; and Miyake, Yasuo, 4,985,245, Cl. 424-94.300.
Asakawa, Yoshiaki: *See—*
Ichikawa, Akira; Asakawa, Yoshiaki; Komatsu, Akio; and Oohira, Eiji, 4,985,923, Cl. 381-38.000.
Asano, Kyoichi: *See—*
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,573, Cl. 549-402.000.
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,574, Cl. 549-402.000.
Asano, Masahide: *See—*
Miki, Tosaku; Asano, Masahide; and Hosokami, Toru, 4,985,595, Cl. 564-157.000.
Asano, Takashi: *See—*
Fujiwara, Ryuhei; Fukazawa, Yasuo; and Asano, Takashi, 4,985,891, Cl. 370-110.100.
ASARCO Incorporated: *See—*
El Tawil, Mamdouh M.; and Albrethsen, Adrian E., 4,985,216, Cl. 423-29.000.
Asea Brown Boveri Ltd.: *See—*
Bauer, Friedhelm; and Stockmeier, Thomas, 4,985,741, Cl. 357-34.000.
Aseltine, Cliff L.; and Lendermon, Gary M., to Schlumberger Technology Corporation. Enclosed perforating gun with expendable carrier. 4,984,520, Cl. 102-313.000.
Ashjian, Henry; and Gawel, Henry A., to Mobil Oil Corporation. Production of borated ashless dispersants. 4,985,156, Cl. 252-49.600.
Assal, Jerome V., to AMP Incorporated. Mounting fixture for electrical junction boxes. 4,984,705, Cl. 220-3.900.
Assfalg, Christina. Apparatus for making molds for making metal castings. 4,984,620, Cl. 164-160.100.
Associated Mills, Inc.: *See—*
Peterson, Samuel F.; Hilger, Ronald O.; and Kalnins, William, 4,984,583, Cl. 128-66.000.
Association of American Railroads: *See—*
Winquist, Knut L., 4,984,738, Cl. 239-88.000.
AT&T Bell Laboratories: *See—*
Blyler, Lee L., Jr.; and Grimes, Gary J., 4,984,864, Cl. 350-96.160.

Levinstein, Hyman J.; Powell, William D., Jr.; and Sinha, Ashok K., 4,985,373, Cl. 437-195.000.
Rana, Virendra V. S.; and Tsai, Nun-Sian, 4,985,371, Cl. 437-189.000.

Atac, Robert; Fischler, Mark S.; and Husby, Donald E., to Universities Research Association, Inc. Interprocessor bus switching system for simultaneous communication in plural bus parallel processing system. 4,985,830, Cl. 364-200.000.

Ataka, Kikuo; Imaoka, Koji; Yoshii, Kiyotaka; and Hirotsu, Kenji, to UBE Industries, Ltd.; and Sankyo Co., Ltd. Process for producing substituted phenoxyethylamines oxime. 4,985,596, Cl. 564-258.000.

Atarashi, Shohgo: *See*—
Hayakawa, Isao; Atarashi, Shohgo; Imamura, Masazumi; Yokohama, Shuichi; Higashihashi, Nobuyuki; Sakano, Katsuichi; and Ohshima, Masayuki, 4,985,557, Cl. 540-598.000.

Atlantic Richfield Company: *See*—
Batzle, Michael L.; and Tubman, Kenneth M., 4,984,652, Cl. 181-104.000.

Atmos Energy Corporation: *See*—
Jordan, Mitchell; Mercer, James C.; Straughan, Charles; and Hudson, Rex D., 4,984,448, Cl. 73-40.50R.

Atochem: *See*—
Masini, Jean-Jacques; and Verot, Yvan, 4,985,214, Cl. 422-188.000.

Atochem, Gas de France: *See*—
Rolland, Laurence; Bertoochio, Rene ; and Cheron, Jacques, 4,985,169, Cl. 252-69.000.

Atoma International, A Magna International Company: *See*—
Benoit, Dominque; and Vinden, Jonathan, 4,984,389, Cl. 49-502.000.

Atsugi Motor Parts Company, Limited: *See*—
Kakizaki, Shinobu; Yamaoka, Fumiyuki; Kikushima, Shigeru; and Emura, Junichi, 4,984,819, Cl. 280-707.000.

Au, William G.: *See*—
Knoedler, Roy E.; Au, William G.; and Parker, Robert M., 4,984,845, Cl. 297-250.000.

Audeh, Costandi A., to Mobil Oil Corporation. Process for the removal of mercury from natural gas condensate. 4,985,137, Cl. 208-251.00H.

Audeh, Costandi A.; and Greco, Saverio G., to Mobil Oil Corporation. Hydrogen fluoride vapor containment. 4,985,220, Cl. 423-240.000.

Audeh, Costandi A., to Mobil Oil Corporation. Polysulfide treated molecular sieves and use thereof to remove mercury from liquefied hydrocarbons. 4,985,389, Cl. 502-516.000.

Audi AG: *See*—
Sterler, Georg; and Bader, Heinz, 4,985,835, Cl. 364-424.050.

Auer, Heinz; and Winkler, Gernot, to Siemens Aktiengesellschaft. Method for the manufacture of solid electrolyte capacitors. 4,984,342, Cl. 29-25.030.

Auergesellschaft GmbH: *See*—
Dahrendorf, Klaus D.; and Noack, Ulrich, 4,984,476, Cl. 73-864.350.

Auge, Patrick: *See*—
Arretz, Emmanuel; Auge, Patrick; Mirassou, Alfred; and Landoussy, Claude, 4,985,586, Cl. 560-18.000.

August, Melvin C.: *See*—
Neumann, Eugene F.; August, Melvin C.; and Bowen, Stephen A., 4,984,993, Cl. 439-157.000.

Aull, Brian F.; Nichols, Kirby B.; and Sollner, T. C. L. Gerhard, to Massachusetts Institute of Technology. Electrooptical switch with separate detector and modulator modules. 4,985,621, Cl. 250-213.00A.

Ausimont S.r.l.: *See*—
Moggi, Giovanni; Ingoglia, Desiderata; and Lenti, Daria, 4,985,282, Cl. 427-393.000.

Austad, Eric D. Tissue expander. 4,984,585, Cl. 128-899.000.

Australian National University, The: *See*—
Ringwood, Alfred E., 4,985,051, Cl. 51-309.000.

Avdel Systems Limited: *See*—
Flauraud, Daniel J. N., 4,984,947, Cl. 411-43.000.

Avsan, Oleg: *See*—
Jonsson, Bjorn E. R.; Johnson, Sten E.; Kling, Lars-Orjan; and Avsan, Oleg, 4,985,826, Cl. 364-200.000.

Awano, Katsuya: *See*—
Ohashi, Mitsuo; Awano, Katsuya; Tanaka, Toshio; and Kimura, Tetsuya, 4,985,585, Cl. 560-9.000.

Axel, Richard: *See*—
Julius, David J.; Axel, Richard; and Jessell, Thomas M., 4,985,352, Cl. 435-6.000.

Axis S.p.A.: *See*—
Santandrea, Luciano; and Lombardi, Massimo, 4,984,353, Cl. 29-714.000.

Ayata, Naoki; Sato, Yasushi; Saito, Seiji; Koumura, Noboru; and Fujii, Motoharu, to Canon Kabushiki Kaisha. Copying apparatus capable of designating image areas. 4,985,778, Cl. 358-296.000.

Ayres, Barry E.: *See*—
Foxton, Michael W.; Ayres, Barry E.; and Cooper, Anthony W. J., 4,985,407, Cl. 514-19.000.

Ayukai, Kemmi: *See*—
Fukui, Tsutomu; Koike, Hideto; and Ayukai, Kemmi, 4,985,636, Cl. 250-559.000.

Azamatov, Ramil A.; Zamitter, Mikhail N.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; and Smirnov, Igor G., to Kievsky Injenerno-Stroitelny Institut. Fully articulated suspension of tandem wheels of a transport vehicle. 4,984,817, Cl. 280-680.000.

Azami, Kyoichiro; and Kume, Shouji, to Dainippon Ink and Chemicals, Inc. Process and apparatus for producing printing plates. 4,985,322, Cl. 430-49.000.

Azuma, Daisuke: *See*—
Matsumoto, Satoshi; Azuma, Daisuke; and Miyata, Souichi, 4,985,890, Cl. 370-94.100.

Azuma, Junzou: *See*—
Otsubo, Toru; Tokuda, Mitsuo; Yamaguchi, Yasuhiro; Sasaki, Ichirou; Ohara, Kazuhiro; Usuami, Hirohisa; and Azuma, Junzou, 4,985,109, Cl. 156-345.000.

B.F. Goodrich Company, The: *See*—
Phillips, Ronald W., II, 4,984,946, Cl. 411-34.000.

Baba, Takeshi: *See*—
Nose, Noriyuki; Nakajima, Toshiyuki; Kawakami, Eigo; Baba, Takeshi; Kushibiki, Nobuo; Matsugu, Masakazu; and Niwa, Yukichi, 4,985,186, Cl. 264-1.700.

Babitzka, Rudolf; Reiter, Ferdinand; and Romann, Peter, to Robert Bosch GmbH. Electromagnetically actuatable valve. 4,984,744, Cl. 239-585.000.

Bachtell, Stephen R. Hair styling comb. 4,984,590, Cl. 132-161.000.

Baden, Niels T.; Jensen, Ernst J.; and Larsen, Jorgen G., to Haldor Topsoe A/S. Method of carrying out heterogeneous catalytic chemical processes. 4,985,230, Cl. 423-650.000.

Bader, Heinz: *See*—
Sterler, Georg; and Bader, Heinz, 4,985,835, Cl. 364-424.050.

Baggett, Neil: *See*—
Barker, Sidney A.; Baggett, Neil; Stevenson, John; George, Raymond D.; De Courcy, David R.; Hammond, Timothy; and Bradley, Martin, 4,985,489, Cl. 524-594.000.

Bailey, Arthur. Apparatus for exercising and conditioning a hand. 4,984,784, Cl. 272-67.000.

Bailey, Carlos: *See*—
Spain, Raymond G.; and Bailey, Carlos, 4,984,502, Cl. 87-8.000.

Bailey, Thomas F.; and Strickland, James N., to Drilex Systems, Inc. Geothermal wellhead repair unit. 4,984,636, Cl. 166-277.000.

Bajer, Manfred: *See*—
Klose, Sigmar; Erler, Klaus; Uhl, Wolfgang; and Bajer, Manfred, 4,985,204, Cl. 422-56.000.

Bajpai, Atul; Marczewski, Richard W.; Marek, Melissa M.; Shrivastava, Anil B.; Amble, Charles S.; Joyce, Robert H.; Kishore, Nanda; and Ollanik, Steven J., to General Motors Corporation. Method and apparatus for diagnosing machines. 4,985,857, Cl. 364-551.010.

Bakalash, Reuven: *See*—
Kaufman, Arie E.; and Bakalash, Reuven, 4,985,856, Cl. 364-522.000.

Baker, James A.; James, Stuart L.; Ibrahim, Tuncel; and Marriott, Christopher, to National Research Development Corporation. Alicyclic compounds and their contraceptive use. 4,985,462, Cl. 514-623.000.

Balban, Morton S.; Lan, Ming-Shong; and Panos, Rodney M., to Rockwell International Corporation. Method of and apparatus for composing a press imposition. 4,984,773, Cl. 270-5.000.

Baldino, Michael, to Dayton Superior Corporation. Device and method for housing a steel reinforcement in an area where joints are made between first and subsequently poured concrete structures. 4,984,401, Cl. 52-378.000.

Baliga, Bantval J.: *See*—
Shenai, Krishna; Baliga, Bantval J.; Piacente, Patricia A.; and Korman, Charles S., 4,985,740, Cl. 357-23.400.

Balma, Giorgio. Easy access metal staple stapler. 4,984,729, Cl. 227-128.000.

Balzer, Dieter; and Lueders, Harald, to Huels Aktiengesellschaft. Process for the extraction of crude oil from an underground deposite using surfactants. 4,985,154, Cl. 252-8.554.

Balzer, Juliane: *See*—
Wirtz, Herbert; Feustel, Michael; and Balzer, Juliane, 4,985,048, Cl. 44-394.000.

Balzer, Norbert R.: *See*—
Pfaffmann, George D.; Kubis, Charles S.; Currie, John P.; Balzer, Norbert R.; Walter, John; and Adams, Graham R., 4,984,414, Cl. 53-478.000.

Balzli, Samuel; and Syfrig, Werner, to Von Moose Stahl AG. Apparatus for partial tempering of rolled wire products made of steel. 4,984,770, Cl. 266-106.000.

Baney, Ronald H.; Bilgrien, Carl J.; Fiedler, Lawrence D.; and Lee, Chi-long, to Dow Corning Corporation. Silacyclobutanes. 4,985,565, Cl. 548-110.000.

Baranski, Antoni S., to Ampex Corporation. Carriage mechanism for automatic extracting and inserting of cassettes. 4,984,897, Cl. 360-92.000.

Baratoff, Alexis: *See*—
Gutierrez, Santos F. A.; Baratoff, Alexis; and Pohl, Wolfgang D., 4,985,627, Cl. 250-306.000.

Barker, Roger N.: *See*—
Butters, Alan; and Barker, Roger N., 4,985,301, Cl. 428-336.000.

Barker, Sidney A.; Baggett, Neil; Stevenson, John; George, Raymond D.; De Courcy, David R.; Hammond, Timothy; and Bradley, Martin, to Foseco International Limited. Production of articles of bonded particulate material and binder compositions for use therein. 4,985,489, Cl. 524-594.000.

Barraclough, Chet. Golf putting stroke trainer apparatus. 4,984,802, Cl. 273-192.000.

Barseghian, Iemma, legal representative: *See*—
Hwang, David; Lev-Ran, Arye; and Barseghian, Ken, deceased, 4,985,439, Cl. 514-312.000.

Barseghian, Ken, deceased: *See*—
Hwang, David; Lev-Ran, Arye; and Barseghian, Ken, deceased, 4,985,439, Cl. 514-312.000.

Barth, Armin: *See—*
Kurr, Klaus; Eckel, Hans-Gerd; Seifert, Heinz; Idigkeit, Werner; and Barth, Armin, 4,984,777, Cl. 267-140.100.

Barthelemy, Pascal: *See—*
Mignani, Gerard; Barthelemy, Pascal; and Meyrueix, Remi, 4,985,528, Cl. 528-59.000.

Bartholic, David B. Ultra-short contact time fluidized catalytic cracking process. 4,985,136, Cl. 208-153.000.

Bartz, Wilfried: *See—*
Schueler, Ralf; Muegge, Joachim; Droescher, Michael; Bartz, Wilfried; and Feinauer, Roland, 4,985,494, Cl. 525-67.000.

BASF Aktiengesellschaft: *See—*
Bronstert, Klaus; Hoenl, Hans; Echte, Adolf; and Klaerner, Peter, 4,985,503, Cl. 525-193.000.
Spang, Peter; Neumann, Peter; and Trauth, Hubert, 4,985,566, Cl. 548-328.000.

BASF Corporation: *See—*
Perry, John G.; and Spelyng, Walter A., 4,985,551, Cl. 536-18.600.

Basile, Peter A.; Madan, Ashvani K.; Snyder, Fred E.; and Stillman, Harold M., to American Standard Inc. Flushing mechanism with low water consumption. 4,984,311, Cl. 4-354.000.

Basse, Hartwig; and Wittek, Jurgen, to Norddeutsche Seekabelwerke Aktiengesellschaft. Packing element. 4,985,182, Cl. 261-94.000.

Bateman, Steven P.: *See—*
Korsunsky, Iosif; Bateman, Steven P.; and Grabbe, Dimitry G., 4,984,997, Cl. 439-331.000.

Batt, Douglas G., to Du Pont de Nemours, E. I., and Company. 2-substituted-1-naphthols as 5-lipoxygenase inhibitors. 4,985,435, Cl. 514-277.000.

Batt, Douglas G., to Du Pont de Nemours, E. I., and Company. 2-substituted-1-naphthols as 5-lipoxygenase inhibitors. 4,985,442, Cl. 514-277.000.

Batty, Denis, to Kedgwick Limited. Processing of denim garments. 4,984,438, Cl. 68-27.000.

Batzle, Michael L.; and Tubman, Kenneth M., to Atlantic Richfield Company. Torsional wave logging tool. 4,984,652, Cl. 181-104.000.

Bauer, Friedhelm; and Stockmeier, Thomas, to Asea Brown Boveri Ltd. MOS-controlled bipolar power semiconductor component. 4,985,741, Cl. 357-34.000.

Bauer, Max: *See—*
Bienert, Horst; and Bauer, Max, 4,984,332, Cl. 16-93.00R.

Bauer, Theodor; Zweigart, Gerhard; and Gramer, Kurt, to Daimler-Benz Aktiengesellschaft. Folding top for vehicles. 4,984,841, Cl. 296-118.000.

Bayer Aktiengesellschaft: *See—*
Blum, Harald; Hohlein, Peter; Sonntag, Michael; and Wellner, Wolfgang, 4,985,506, Cl. 525-298.000.
Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, 4,985,452, Cl. 514-383.000.
Claussen, Uwe; and Herrmann, Udo, 4,985,124, Cl. 204-72.000.
Dziurla, Hans-Jurgen; Reinking, Klaus; Wehnert, Wolfgang; and Tresper, Erhard, 4,985,175, Cl. 252-506.000.
Eckel, Thomas; Wittmann, Dieter; Leitz, Edgar; Schoeps, Jochen; Ott, Karl-Heinz; and Peters, Horst, 4,985,493, Cl. 525-67.000.
Endres, Robert; Weber, Wilhelm; and Preuss, Krystyna, 4,985,476, Cl. 523-210.000.
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 4,985,063, Cl. 71-88.000.
Heinz, Hans-Detlef; Hansel, Eduard; Meyer, Rolf-Volker; and Arend, Gunter, 4,985,534, Cl. 528-272.000.
Hildebrand, Heinz; Zitzmann, Werner; Arlt, Dieter; and Kolbl, Geinz, 4,985,364, Cl. 435-254.000.
Kramer, Wolfgang; Weissmuller, Joachim; Berg, Dieter; Brandes, Wilhelm; and Dutzmann, Stefan, 4,985,421, Cl. 514-212.000.
Mussig, Bernhard; Meyer, Rolf-Volker; Dhein, Rolf; and Brassat, Bert, 4,985,508, Cl. 525-420.500.
Naumann, Rolf; Rademachers, Jakob; and Rodi, Fritz, 4,985,073, Cl. 75-255.000.
Pakull, Ralf; Freitag, Dieter; Eckhardt, Volker; Idel, Karsten-Josef; and Westeppe, Uwe, 4,985,532, Cl. 528-190.000.
Rademachers, Jakob; Wilhelm, Volker; Keifer, Siegfried; and Burow, Wilfried, 4,985,078, Cl. 106-419.000.
Rosthauser, James W.; Meckel, Walter; and Rasshofer, Werner, 4,985,490, Cl. 524-871.000.
Schubart, Rudiger; Pieroth, Manfred; and Kempermann, Theo, 4,985,305, Cl. 428-389.000.
Sommer, Herbert; Arlt, Dieter; Hartwig, Jurgen; Homeyer, Bernhard; and Matthaei, Hans-Detlef, 4,985,415, Cl. 514-118.000.
Westeppe, Uwe; Lindner, Christian; Piejko, Karl-Erwin; and Laue, Hans-Joachim, 4,985,486, Cl. 524-514.000.
Wittmann, Dieter; Eckel, Thomas; Ott, Karl-Heinz; Damrath, Volker; and Westeppe, Uwe, 4,985,492, Cl. 525-63.000.

Bayer, Oswald: *See—*
Kronenberger, Alban; and Bayer, Oswald, 4,984,908, Cl. 384-478.000.

Beacham, Dwight A.; Woron, Robert P.; and Whitefield, John T., to Allen Organ Company. Apparatus for deriving and replicating complex musical tones. 4,984,496, Cl. 84-625.000.

Beamenderfer, Robert E.; Buchheister, Raymond R., Jr.; Ellis, John R.; Miller, Charles A.; Moist, Stanford C., Jr.; and Zelko, William E., to AMP Incorporated. Cable connector with a low inductance path. 4,984,992, Cl. 439-108.000.

Beatty, David E., to Dutchess Bakers' Machinery Co. Inc. Divider head assembly. 4,984,978, Cl. 425-185.000.

Beaumont, David O.: *See—*
Morrison, David G.; Heron, Andrew P.; and Beaumont, David O., 4,985,766, Cl. 358-133.000.

Beck, Charles E. J.: *See—*
Narula, Anubhav P. S.; Beck, Charles E. J.; and Hanna, Marie R., 4,985,403, Cl. 512-19.000.

Beck, James M., to Creative Packaging Corporation. Two piece tamper evident hinged closure cap. 4,984,716, Cl. 222-153.000.

Beck, Nicholas C.; Gemmell, Peter A.; and Hann, Richard A., to Imperial Chemical Industries PLC. Thermal transfer dyesheet. 4,985,398, Cl. 503-227.000.

Becker, Benedikt: *See—*
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 4,985,063, Cl. 71-88.000.

Becker, Henning: *See—*
Boebel, Manfred; and Becker, Henning, 4,985,033, Cl. 606-148.000.

Becker, Werner, to Esselte Meto International Produktions GmbH. Labelling apparatus. 4,985,110, Cl. 156-540.000.

Beckman, Keith F.: *See—*
Agarwala, Birendra N.; Beckman, Keith F.; Cooper-Joselow, Alice H.; Narayan, Chandrasekhar; Purushothaman, Sampath; and Ray, Sudipta K., 4,985,310, Cl. 428-620.000.

Beckmeyer, Richard F., to General Motors Corporation. Method for manufacturing a die for extruding honeycomb material. 4,984,487, Cl. 76-107.100.

Becton, Dickinson and Company: *See—*
Shillington, Richard A., 4,984,686, Cl. 206-366.000.

Bedes, Amour: *See—*
Hellard, Guy; and Bedes, Amour, 4,985,801, Cl. 361-215.000.

Bedu, Guy; and Chabanne, Jean-Pierre, to Tubauto. Movable arm rest with motorized adjustment. 4,984,847, Cl. 297-411.000.

Bee, Rodney D.; Evans, Ian D.; and Izzard, Martin J., to Unilever Patent Holdings B.V. Emulsions. 4,985,250, Cl. 424-401.000.

Beecham Inc.: *See—*
Ibrahim, Nader; and Sodano, Jeanette L., 4,985,236, Cl. 424-52.000.

Bekker-Madsen, Per, to R. Ancker Jorgensen A/S. Method for dispensing of labels. 4,985,096, Cl. 156-64.000.

Belanger, Thomas D., Jr., to AG Communication Systems Corporation. Universal tape for use in tape automated bonding system. 4,985,748, Cl. 357-69.000.

Bell, Rodney E.: *See—*
Lindsay, Robert J.; Bell, Rodney E.; and McNickle, William, 4,984,948, Cl. 412-1.000.

Bellis, Harold E.; Dumas, Donald J.; Sonnichsen, George C.; and Subramanyam, Vinayakam, to Du Pont de Nemours, E. I., and Company. Process for preparing phenyl esters of substituted acids. 4,985,180, Cl. 260-404.000.

Belokin, Martin: *See—*
Belokin, Paul, Jr.; and Belokin, Martin, 4,984,693, Cl. 211-88.000.

Belokin, Paul, Jr.; and Belokin, Martin, to Martin Paul, Inc. Product display shelf. 4,984,693, Cl. 211-88.000.

Bendix Europe Services Techniques: *See—*
Thioux, Alain; and Levrai, Roland, 4,984,853, Cl. 303-22.800.

Bendix France: *See—*
Meynier, Guy, 4,984,661, Cl. 188-71.500.
Perez, Miguel, 4,984,506, Cl. 91-369.200.

Bengtsson, Christer, to Forsheda AB. Pipe socket and a method of forming a pipe socket. 4,984,831, Cl. 285-379.000.

Bennet, Tom J., to Aktiebolaget Electrolux. Spirit stove. 4,984,559, Cl. 126-43.000.

Benoit, Dominque; and Vinden, Jonathan, to Atoma International, A Magna International Company. Automobile door with flush mounted glass. 4,984,389, Cl. 49-502.000.

Benson, Merritt D. Key holder. 4,984,442, Cl. 70-456.00R.

Bent, James E.: *See—*
Wilkinson, William T.; and Bent, James E., 4,985,695, Cl. 340-571.000.

Beomont, Jorge J., to Lagoven S.A. Electronic controller by resistivity of water-oil interface. 4,985,696, Cl. 340-618.000.

Beretta, Pier G., to Fabbrica D'Armi P. Beretta S.p.A. Device to open and close the bolt in semiautomatic pistols. 4,984,504, Cl. 89-163.000.

Berfield, Robert C., to Shop-Vac Corporation. Drip cleaner attachment with solid cleaning concentrate. 4,984,328, Cl. 15-322.000.

Berfield, Robert C.; and Meland, Ronald F., to Shop-Vac Corporation. Nozzle assembly for a vacuum device. 4,984,330, Cl. 15-415.10R.

Berg, Dieter: *See—*
Kramer, Wolfgang; Weissmuller, Joachim; Berg, Dieter; Brandes, Wilhelm; and Dutzmann, Stefan, 4,985,421, Cl. 514-212.000.

Bergeron, Emile, to L'Unite Hermetique. Anti-vibratory device to attach a hermetic compresser chamber to its base. 4,984,971, Cl. 417-363.000.

Bergmann, Eckhard: *See—*
Hofler, Heinrich; and Bergmann, Eckhard, 4,984,898, Cl. 356-358.000.

Bergner, Arndt, to Hilti Aktiengesellschaft. Expansion dowel assembly. 4,984,945, Cl. 411-30.000.

Bergwerksverband GmbH: *See—*
Haruna, Kazuo; Ueda, Kanji; Inoue, Masahiro; and Someda, Hitosi, 4,985,052, Cl. 55-26.000.

Berneur, Claude; and Boiteau, Jean-Pierre, to Bull S.A. Substrate for very large scale integrated circuit and apparatus for selective tinning of the substrate leads. 4,985,749, Cl. 357-70.000.

Bertoochio, Rene : *See*—
Rolland, Laurence; Bertoochio, Rene ; and Cheron, Jacques, 4,985,169, Cl. 252-69.000.

Bertsch, Gotthilf; and Braum, Josef, to Sulzer Brothers Limited. Tuck-in needle and a pneumatic selvedge-forming device for a loom. 4,984,608, Cl. 139-434.000.

Bertschy, Alain: *See*—
Strada, Antonio; Bertschy, Alain; Guoli, Giacomo; and Mowka, Edmund J., Jr., 4,985,181, Cl. 261-87.000.

Bes, Richard F. T.; and Knol, Jan D., to Holland Colours Apeldoorn BV. Method for coloring plastic granules by mixing with coloring agent at ambient temperature. 4,985,187, Cl. 264-13.000.

Beswick, Paul J.: *See*—
North, Peter C.; Oxford, Alexander W.; Coates, Ian H.; and Beswick, Paul J., 4,985,422, Cl. 514-215.000.

Beyaert, Daniel, to Picanol N.V. Device for driving harnesses of weaving machines. 4,984,607, Cl. 139-79.000.

Bianchi, Daniele; Cesti, Pietro; and Golini, Paolo, to Montedison S.p.A. Process for the enzymatic resolution of the optical isomers of racemic ester derivatives of 3-mercapto-2-alkyl-propionic acid. 4,985,366, Cl. 435-280.000.

Bianco, Frank J.; Owen, Charles W.; and Talamas, Elie, Jr., to Elexis Corporation. Suntan indicator. 4,985,632, Cl. 250-372.000.

Biazzi, Giuseppe: *See*—
Villa, Ezio; Biazzi, Giuseppe; and Guelfi, Giorgio, 4,984,843, Cl. 296-213.000.

Bidwell, Ralph: *See*—
Wells, Richard C., 4,984,344, Cl. 29-261.000.

Bienert, Horst; and Bauer, Max, to Webasto AG Fahrzeugtechnik. Slide shoe. 4,984,332, Cl. 16-93.00R.

Bilgrien, Carl J.: *See*—
Baney, Ronald H.; Bilgrien, Carl J.; Fiedler, Lawrence D.; and Lee, Chi-long, 4,985,565, Cl. 548-110.000.

Bingham, David W., to Pitters Pty. Ltd. Method for processing pineapples. 4,985,268, Cl. 426-482.000.

Bio-Rad Laboratories, Inc.: *See*—
Burd, Samuel, 4,985,129, Cl. 204-299.00R.

BioCryst, Inc.: *See*—
Secrist, John A., III; Montgomery, John A.; Ealick, Steve E.; Erion, Mark D.; and Guida, Wayne C., 4,985,433, Cl. 514-258.000.
Secrist, John A., III; Montgomery, John A.; Ealick, Steve E.; Erion, Mark D.; and Guida, Wayne C., 4,985,434, Cl. 514-248.000.

Bionix Corporation: *See*—
Glick, J. Leslie, 4,985,256, Cl. 424-697.000.

BIP Chemicals, Ltd.: *See*—
Heywood, Derek W.; and Howarth, Stuart B., 4,985,040, Cl. 8-128.100.

Bird, Derek G.; and Westlake, Anthony S., to GBE International plc. Rotary drier control by adjustment of air flow or air humidity. 4,984,374, Cl. 34-50.000.

Bjoerk, Erik; and Wiklund, Ola, to Siemens Aktiengesellschaft. Exposure unit for a film changer. 4,985,909, Cl. 378-173.000.

Bjork, Jon A., to Minnesota Mining and Manufacturing Company. Colored thermographic media. 4,985,392, Cl. 503-211.000.

Blackburn, G. Michael: *See*—
Trager, Seymour F.; and Blackburn, G. Michael, 4,985,417, Cl. 514-155.000.

Blake, Douglas T.: *See*—
White, Edward C.; Blake, Douglas T.; and Grassel, Michael C., 4,984,941, Cl. 408-104.000.

Blanchard, Gilbert: *See*—
Prigent, Michel; Blanchard, Gilbert; Garreau, Francois; and Courty, Philippe, 4,985,387, Cl. 502-304.000.

Blank, Lynne M. B.; Boyce, Thomas D.; and White, William C., to Dow Corning Corporation; and Dow Chemical Company. Antimicrobial superabsorbent articles. 4,985,023, Cl. 604-360.000.

Blickle, Peter; Hintzer, Klaus; Schwertfeger, Werner; and Strutz, Heinz, to Hoechst Aktiengesellschaft. Process for the preparation of fluorinated carboxylic acid fluorides. 4,985,594, Cl. 562-851.000.

Blizzard, C. Andrew. Range finding archery bow sight for hunting. 4,984,372, Cl. 33-265.000.

Block, Karl-Heinz, to Zinser Textilmaschinen GmbH. Apparatus for transporting textile laps. 4,984,335, Cl. 19-65.00A.

Bloom, Leonard: *See*—
Cohen, Todd J., 4,984,572, Cl. 128-419.00D.

Blum, Harald; Hohlein, Peter; Sonntag, Michael; and Wellner, Wolfgang, to Bayer Aktiengesellschaft. Oxidatively cross-linkable, water dilutable binders, a process for their preparation and their use. 4,985,506, Cl. 525-298.000.

Blyler, Lee L., Jr.; and Grimes, Gary J., to AT&T Bell Laboratories. Optical splitter having a self-contained optical source. 4,984,864, Cl. 350-96.160.

Board of Regents, The University of Texas System: *See*—
Lipton, James M., 4,985,034, Cl. 606-167.000.

BOC Group, Inc., The: *See*—
Thorne, Jonathan O.; and Crowley, Christopher T., 4,985,055, Cl. 55-189.000.

Bockmiller, Douglas F. Clean room channel wall system. 4,984,400, Cl. 52-241.000.

Boden, Richard M.: *See*—
Kang, Young C.; Tan, Chee-Teck; Byrne, Brian; Buckholz, Lawrence L., Jr; Sudol, Marion A.; and Boden, Richard M., 4,985,261, Cl. 426-243.000.

Boebel, Manfred; and Becker, Henning, to Richard Wolf GmbH. Apparatus for fixing fascial holding sutures in open laparoscopy. 4,985,033, Cl. 606-148.000.

Boehm, Erwin: *See*—
Zilch, Harald; Mertens, Alfred; Von Der Saal, Wolfgang; Boehm, Erwin; and Strein, Klaus, 4,985,448, Cl. 514-339.000.

Boehringer Mannheim GmbH: *See*—
Fritsche, Rainer; Nohl, Klaus; Pollmann, Klaus; and Schmidt, Elmar, 4,985,205, Cl. 422-56.000.
Guethlein, Werner; and Merdes, Hartmut, 4,985,414, Cl. 514-100.000.
Klose, Sigmar; Erler, Klaus; Uhl, Wolfgang; and Bajer, Manfred, 4,985,204, Cl. 422-56.000.
Leinert, Herbert, 4,985,454, Cl. 514-411.000.
Zilch, Harald; Mertens, Alfred; Von Der Saal, Wolfgang; Boehm, Erwin; and Strein, Klaus, 4,985,448, Cl. 514-339.000.

Boeing Company, The: *See*—
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,985,568, Cl. 548-431.000.
Walsh, John B., 4,985,899, Cl. 375-1.000.

Boikov, Vladimir P.: *See*—
Kozachevsky, Gennady G.; Boikov, Vladimir P.; Guskov, Valery V.; Molodan, Oleg I.; Sizova, Svetlana I.; and Gorodnichev, Jury N., 4,984,976, Cl. 425-35.000.

Boisgontier, Jean Marc; and Caville, Christian, to Societe Anonyme dite: Alcatel CIT. Coupling device between in optical fiber and an opto-electronic component. 4,984,866, Cl. 350-96.200.

Boisvert, Paul J. Self ventilating toilet. 4,984,305, Cl. 4-213.000.

Boiteau, Jean-Pierre: *See*—
Berneur, Claude; and Boiteau, Jean-Pierre, 4,985,749, Cl. 357-70.000.

Bokerman, Gary N.; Hampton, James E.; and Uhlmann, John G., to Dow Corning Corporation. Removal of hydrogen-containing silanes from organosilane mixtures. 4,985,579, Cl. 556-466.000.

Bollenrath, Franz-Michael; and Rigler, Josef K., to Huls AG. Agitator vessel with radially conveying agitator and with at least one baffle, as well as process for the thorough mixing of liquids with the aid of this agitator vessel. 4,984,899, Cl. 366-302.000.

Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,984,418, Cl. 56-13.600.

Bon, Henry, to Langston Machine Company Limited, The. Stacking bundles of flat-folded boxes of corrugated board. 4,984,963, Cl. 414-789.500.

Bonham, James A.: *See*—
Rossman, Mitchell A.; and Bonham, James A., 4,985,562, Cl. 544-209.000.

Bonin, Yves; and LeBlanc, Jack, to Rhone-Poulenc Chimie. Fire-resistant polyamide compositions. 4,985,485, Cl. 524-403.000.

Bonnet, Maurice, to Salomon S.A. Downhill ski boot. 4,984,375, Cl. 36-119.000.

Bonvini, Alberto: *See*—
Addeo, Antonio; Bonvini, Alberto; Reggiani, Romano; and Vezzoli, Annibale, 4,985,303, Cl. 428-36.500.

Boos, Margarete: *See*—
Buhler, Ulrich; Hahnke, Manfred; Kuhn, Reinhard; and Boos, Margarete, 4,985,043, Cl. 8-639.000.

Borden, Inc.: *See*—
Irvin, Scot A.; Fedor, Robert A.; and Merritt, Carleton G., 4,985,269, Cl. 426-560.000.

Boryta, Daniel A., to Leak Sensors, Inc. Leak monitor for secondary containment of liquid stored in underground storage tanks. 4,985,682, Cl. 324-557.000.

Bose, Sudhangshu; and Gorman, Michael E., to International Fuel Cells Corporation. Corrosion resistant fuel cell substrates. 4,985,316, Cl. 429-44.000.

Bossenmaier, Alban: *See*—
Grosch, Lothar; Zeidler, Falk; Katz, Egon; and Bossenmaier, Alban, 4,984,651, Cl. 180-268.000.

Botez, Dan; Jansen, Michael; Mawst, Luke J.; Peterson, Gary L.; Simmons, William W.; Wilcox, Jaroslava Z.; and Yang, Jane J. J., to TRW Inc. Semiconductor laser array having high power and high beam quality. 4,985,897, Cl. 372-50.000.

Boulton, David A., to Learning Insights, Ltd. Electronic book educational publishing method using buried reference materials and alternate learning levels. 4,985,697, Cl. 340-750.000.

Bowen, Stephen A.: *See*—
Neumann, Eugene F.; August, Melvin C.; and Bowen, Stephen A., 4,984,993, Cl. 439-157.000.

Bowman, David J.; Cosgrove, Raymond F.; Male, Terence P.; and Evans, Robert, to Shandon Scientific Limited. Tissue processing apparatus. 4,985,206, Cl. 422-99.000.

Boyce, Thomas D.: *See*—
Blank, Lynne M. B.; Boyce, Thomas D.; and White, William C., 4,985,023, Cl. 604-360.000.

Boyd, David W., to Hewlett-Packard Company. Scanner mirror clip assembly. 4,984,882, Cl. 350-632.000.

Bozinovic, Zoran. Surface projectile game with zig-zag ball. 4,984,795, Cl. 273-126.00R.

BP Chemicals Limited: *See*—
Kitson, Melanie; and Williams, Peter S., 4,985,572, Cl. 549-326.000.

Brabender, John: *See*—
Yoshida, Noble H.; and Brabender, John, 4,985,484, Cl. 524-379.000.

Bradford, William G.; Arsenault, Gilles J.; and Marshall, Alexander J., to Polysar Limited. Process for removing rhodium-containing cata-

lyst residue from hydrogenated nitrile rubber. 4,985,540, Cl. 528-482.000.

Bradley, Martin: *See*—
Barker, Sidney A.; Baggett, Neil; Stevenson, John; George, Raymond D.; De Courcy, David R.; Hammond, Timothy; and Bradley, Martin, 4,985,489, Cl. 524-594.000.

Bragaglia, Giorgio, to Comas S.p.A. Rotary cutting head, particularly for tobacco cutting machines. 4,984,491, Cl. 83-338.000.

Brand, Ernest E., Jr.: *See*—
Chambers, Gary C.; and Brand, Ernest E., Jr., 4,984,713, Cl. 222-105.000.

Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, to Bayer Aktiengesellschaft. Fungicidal agents. 4,985,452, Cl. 514-383.000.

Brandes, Wilhelm: *See*—
Kramer, Wolfgang; Weissmuller, Joachim; Berg, Dieter; Brandes, Wilhelm; and Dutzmann, Stefan, 4,985,421, Cl. 514-212.000.

Brassat, Bert: *See*—
Mussig, Bernhard; Meyer, Rolf-Volker; Dhein, Rolf; and Brassat, Bert, 4,985,508, Cl. 525-420.500.

Brault, Richard; Croteau, Dianne; and Vinden, Jonathan, to Actar Airforce, Inc. CPR manikin. 4,984,987, Cl. 434-265.000.

Braum, Josef: *See*—
Bertsch, Gotthilf; and Braum, Josef, 4,984,608, Cl. 139-434.000.

Braun, Manfred H.: *See*—
Braun, Thomas F.; and Braun, Manfred H., 4,984,762, Cl. 248-216.100.

Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, to Deere & Company. Edger with belt braking device. 4,984,417, Cl. 56-11.300.

Braun, Thomas F.; and Braun, Manfred H. Rear drawer slide frame mounting screw with adjustable position compression spring. 4,984,762, Cl. 248-216.100.

Braverman, George J. Shoe holder. 4,984,327, Cl. 15-267.000.

Breider, Jacob; and Arends, Arend; R., to Vennootschap onder firma: ALVA. Word processor work station with a braille reading line. 4,985,692, Cl. 340-407.000.

Brennan, Kevin F.: *See*—
Gaylord, Thomas K.; Brennan, Kevin F.; and Glytsis, Elias N., 4,985,737, Cl. 357-4.000.

Bridgestone Corporation: *See*—
Akiyama, Setsuo; Monobe, Hisanobu; Naito, Kazuo; Honda, Toshio; and Tanaka, Kazuo, 4,985,510, Cl. 525-427.000.

Bridgestone Flowtech Corporation: *See*—
Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 4,984,826, Cl. 285-101.000.

BridgeTech Inc.: *See*—
Larson, James, 4,984,321, Cl. 14-71.500.

Briggs & Stratton Corporation: *See*—
Tharman, Paul A., 4,984,543, Cl. 123-179.00A.

Brightbill, Keith E.: *See*—
Hanna, Thomas E.; and Brightbill, Keith E., 4,984,687, Cl. 206-373.000.

Brighton, Geoffrey: *See*—
Roeder, Ronald W. H.; and Brighton, Geoffrey, 4,985,192, Cl. 264-177.100.

Brinckmann, Frank: *See*—
Kuhn, Willi, 4,985,667, Cl. 318-567.000.

Brinkmeier, Friedhelm; and Rautenberg, Horst, to Windmoller & Holscher. Dual belt conveyor for multi-ply continuous paper tubing. 4,984,728, Cl. 226-172.000.

Brisko, William E., Jr.: *See*—
Emmons, Lawrence D.; Mackley, James S.; Stokes, David H.; Stefenel, Rudolph S.; Brisko, William E., Jr.; and Cooper-Hart, Michael A., 4,985,911, Cl. 379-53.000.

British Gas plc: *See*—
Williams, Alan; Wilson, John D.; Wragg, Roger D.; Jones, Stephen D.; Komodromos, Costa; and Reynolds, Timothy J., 4,985,385, Cl. 502-84.000.

British Nuclear Fuels Plc: *See*—
Critchley, Richard J.; and Oldham, Samuel R., 4,984,510, Cl. 98-1.000.

British Petroleum Company, p.l.c., The: *See*—
Kitson, Melanie; and Williams, Peter S., 4,985,572, Cl. 549-326.000.

British Telecommunications public limited company: *See*—
Morrison, David G.; Heron, Andrew P.; and Beaumont, David O., 4,985,766, Cl. 358-133.000.

BroadCom, Inc.: *See*—
Schmidt, Charles J.; Kadin, Joseph; and Poteat, S. Eugene, 4,985,707, Cl. 342-370.000.

Brock, James R. Valve control circuit for irrigation system. 4,985,638, Cl. 307-38.000.

Brokaw, Adrian P.: *See*—
Lapham, Jerome F.; and Brokaw, Adrian P., 4,985,739, Cl. 357-22.000.

Bronstert, Klaus; Hoenl, Hans; Echte, Adolf; and Klaerner, Peter, to BASF Aktiengesellschaft. Preparation of impact-resistant poly(alkyl)styrene. 4,985,503, Cl. 525-193.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Matsuyama, Futoshi; Hirose, Akira; and Takei, Toshiyuki, 4,984,351, Cl. 29-568.000.
Sakai, Jun; and Ohta, Mitsuru, 4,985,727, Cl. 355-27.000.
Sato, Takeaki; Kozaki, Yoshihiro; and Hirota, Kunio, 4,984,443, Cl. 72-67.000.
Suzuki, Kouji, 4,985,346, Cl. 430-350.000.
Takagi, Izumi, 4,985,620, Cl. 250-208.100.

Brown, George T.: *See*—
Aldrich, Gary R.; Brown, George T.; Millis, David B.; and Nowak, Ronald P., 4,985,855, Cl. 364-522.000.

Brown, Gordon L., Jr., to Morrison Molded Fiber Glass Company. Method for the fabrication of sandblasted composite signs. 4,985,101, Cl. 156-154.000.

Brown, James G. Undergarment. 4,984,304, Cl. 2-401.000.

Brown & Williamson Tobacco Corporation: *See*—
Finn, Everett N., 4,984,412, Cl. 53-387.000.

Browning, Edward A., Jr.: *See*—
Campbell, W. Carroll; Evans, Michael W.; Browning, Edward A., Jr.; and Stone, Robert J., 4,985,804, Cl. 361-384.000.

Brownlie, Alan W.; and Lawhead, Jack W., to AMP Incorporated. Retractable access flooring module. 4,984,982, Cl. 439-131.000.

Bruckner, Raimund; Eschner, Axel; Langenfeld, Wilhelm; Oberbach, Manfred; Rothfuss, Hans; and Stusser, Dieter, to Didier-Werke AG. Tap spout for metallurgical vessels and method of repairing. 4,984,769, Cl. 266-44.000.

Bruke, Richard, to Spirac Engineering AB. Driving device. 4,984,477, Cl. 74-89.150.

Brunet, Roberto L. Aquatic recreational equipment. 4,985,006, Cl. 441-076.000.

Brunner, Matthias; Frosien, Juergen; Schmitt, Reinhold; and Lischke, Burkhard, to Siemens Aktiengesellschaft. Particle beam measuring method for non-contact testing of interconnect networks. 4,985,681, Cl. 324-501.000.

Brunton, John S., to Illinois Tool Works, Inc. Shot dispenser. 4,984,719, Cl. 222-454.000.

Brupbacher, John M.: *See*—
Moshier, William C.; Brupbacher, John M.; Christodoulou, Leontios; and Nagle, Dennis C., 4,985,202, Cl. 420-590.000.

Bryant, William A.; and Grab, George P., to Kennametal Inc. Multilayer coated cemented carbide cutting insert. 4,984,940, Cl. 407-119.000.

Bubica, Svetko; and Leik, Mervyn J. Apparatus and method for supporting a cable splice in a cable splice enclosure. 4,985,598, Cl. 174-93.000.

Buchheister, Raymond R., Jr.: *See*—
Beamenderfer, Robert E.; Buchheister, Raymond R., Jr.; Ellis, John R.; Miller, Charles A.; Moist, Stanford C., Jr.; and Zelko, William E., 4,984,992, Cl. 439-108.000.

Buckholz, Lawrence L., Jr: *See*—
Kang, Young C.; Tan, Chee-Teck; Byrne, Brian; Buckholz, Lawrence L., Jr; Sudol, Marion A.; and Boden, Richard M., 4,985,261, Cl. 426-243.000.

Buckley, Lee A.; and Insley, Thomas I., to Minnesota Mining and Manufacturing Company. Absorbent nonwoven webs. 4,985,298, Cl. 428-288.000.

Budden, Raymond G.: *See*—
Scott, Fraser; and Budden, Raymond G., 4,984,370, Cl. 33-241.000.

Buess, Gerd: *See*—
Melzer, Andreas; Naruhn, Markus; Kipfmuller, Karl; Reidenbach, H. D.; and Buess, Gerd, 4,985,030, Cl. 606-51.000.

Bugaut, Andree; and Junino, Alex, to L'Oreal. New substituted metaaminophenols, a process for their preparation, hair-dyeing compositions containing them and a hair-dyeing process. 4,985,042, Cl. 8-421.000.

Buhler, Ulrich; Hahnke, Manfred; Kuhn, Reinhard; and Boos, Margarete, to Cassella Aktiengesellschaft. Mixtures of monoazo dyes containing halogen and cyano substituents. 4,985,043, Cl. 8-639.000.

Buhler, Ulrich; and Hofmann, Klaus, to Cassella Aktiengesellschaft. Mixtures of mono-azo dyestuffs for dyeing and printing hydrophobic synthetic fiber materials. 4,985,045, Cl. 8-639.000.

Buhler, Ulrich: *See*—
Hahnke, Manfred; Kuhn, Reinhard; and Buhler, Ulrich, 4,985,044, Cl. 8-639.000.

Bull S.A.: *See*—
Berneur, Claude; and Boiteau, Jean-Pierre, 4,985,749, Cl. 357-70.000.
Maury, Christian, 4,984,901, Cl. 369-44.260.

Burd, Samuel, to Bio-Rad Laboratories, Inc. Apparatus for capillary electrophoresis. 4,985,129, Cl. 204-299.00R.

Burger, Heinz D., to Alcatel Cit. Method of leak testing a test container with a tracer gas. 4,984,450, Cl. 73-40.700.

Burgert, Paul H.; Goode, Richard L.; and Burke, Terry L. Apparatus for treatment of sensorineural hearing loss, vertigo, tinnitus and aural fullness. 4,984,579, Cl. 128-747.000.

Burgoyne, William F., Jr.; and Dixon, Dale D., to Air Products and Chemicals, Inc. Alkenylated toluenediamines as antioxidants for organic materials. 4,985,159, Cl. 252-50.000.

Burke, Terry L.: *See*—
Burgert, Paul H.; Goode, Richard L.; and Burke, Terry L., 4,984,579, Cl. 128-747.000.

Burns, Richard H. Service lift stand apparatus for small tractors. 4,984,657, Cl. 187-8.470.

Burow, Wilfried: *See*—
Rademachers, Jakob; Wilhelm, Volker; Keifer, Siegfried; and Burow, Wilfried, 4,985,078, Cl. 106-419.000.

Burton, John W. Refillable pressurized beverage container. 4,984,717, Cl. 222-183.000.

Burzynski, Dennis J., to Owens-Illinois Closure Inc. Plastic closure with compression molded sealing liner. 4,984,703, Cl. 215-350.000.

Burzynski, Jean-Pierre: *See*—
Renard, Pierre; Simandoux, Jean-Claude; and Burzynski, Jean-Pierre, 4,985,209, Cl. 422-140.000.

Buschmann, Jeffrey P.: *See—*
Westlund, Arnold, Jr.; and Buschmann, Jeffrey P., 4,985,656, Cl. 313-318.000.
Buss, Rick A.; and Davis, Wilbur M., to Techmedica, Inc. Left and right inferior border osteotomy blade saw. 4,985,031, Cl. 606-82.000.
Butters, Alan; and Barker, Roger N., to Imperial Chemical Industries, plc. Assembly for use in making a printing plate. 4,985,301, Cl. 428-336.000.
Buzby, John H.; and Evans, Robert D., to Quaker Chemical Corporation. Method for controlling pitch deposits in pulp and papermaking processes with organotitanium (IV) compound. 4,985,120, Cl. 162-199.000.
Byrne, Brian: *See—*
Kang, Young C.; Tan, Chee-Teck; Byrne, Brian; Buckholz, Lawrence L., Jr; Sudol, Marion A.; and Boden, Richard M., 4,985,261, Cl. 426-243.000.
C. van der Lely N.V.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,984,418, Cl. 56-13.600.
Cadwell, Gilbert C., to Rohr Industries, Inc. Superplastic drape forming. 4,984,348, Cl. 29-423.000.
Cadwell, Peter F.; and Anglin, Noah L., to Poget Computer Corporation. Hinged casing. 4,984,706, Cl. 220-334.000.
Caldwell, Joseph W.; and Slobodnik, Mark W., to Caldwell System Corp. Ultrasonic liquid level monitoring system. 4,984,449, Cl. 73-49.200.
Caldwell System Corp.: *See—*
Caldwell, Joseph W.; and Slobodnik, Mark W., 4,984,449, Cl. 73-49.200.
Callerio, Antonio; and Callerio, Vincenzo, to F.I.M.A.C. Fabbrica Italiana Macchine Aria Compressa S.p.A. Pump for refrigeration systems, in particular for aeronautical applications. 4,984,964, Cl. 415-55.400.
Callerio, Vincenzo: *See—*
Callerio, Antonio; and Callerio, Vincenzo, 4,984,964, Cl. 415-55.400.
Calmar, Inc.: *See—*
Knickerbocker, Michael G., 4,984,700, Cl. 215-251.000.
O'Neill, R. Kevin, 4,984,920, Cl. 401-127.000.
Camarata, Joseph M., to Xerox Corporation. Baseband local area network using ordinary telephone wiring. 4,985,892, Cl. 370-123.000.
Cambridge Autotransfusion Service: *See—*
Smith, Michael F., 4,985,018, Cl. 604-161.000.
Camire, Alexis L.; Ejike, Ofomata E.; Krumhar, Kim C.; and Taranto, Michael V., to Frito-Lay, Inc. Process for preparing a snack product. 4,985,262, Cl. 426-302.000.
Campbell, Charles T., to LK Technologies, Inc. High flux ion gun apparatus and method for enhancing ion flux therefrom. 4,985,657, Cl. 313-362.100.
Campbell, Robert K.; Cerlanek, John F., Jr.; and Schwalbe, Kurt E. Signature forgery detection device. 4,985,928, Cl. 382-3.000.
Campbell, W. Carroll; Evans, Michael W.; Browning, Edward A., Jr.; and Stone, Robert J., to Codar Technology, Inc. Microcomputer housing and ventilation arrangement. 4,985,804, Cl. 361-384.000.
Cane, David A.: *See—*
Shalom, Stephen R.; and Cane, David A., 4,985,913, Cl. 379-76.000.
Canepa, Victor R. Lock mechanism with step in linkage. 4,984,832, Cl. 292-36.000.
Canevazzi, Giuliano, to Videocolor. Front panel for color television tubes. 4,985,658, Cl. 313-477.00R.
Canon Kabushiki Kaisha: *See—*
Ayata, Naoki; Sato, Yasushi; Saito, Seiji; Koumura, Noboru; and Fujii, Motoharu, 4,985,778, Cl. 358-296.000.
Fujibayashi, Kazuo; Hayakawa, Shingo; and Kiyohara, Shuchi, 4,985,726, Cl. 354-432.000.
Hashimoto, Seiji, 4,985,758, Cl. 358-44.000.
Hideaki, Kawamura, 4,985,849, Cl. 364-518.000.
Hirasawa, Masahide, 4,985,781, Cl. 358-324.000.
Kimizuka, Junichi; Inuyama, Toshihiko; Soya, Takashi; and Noguchi, Yasutaka, 4,985,896, Cl. 372-38.000.
Maeshima, Katsuyoshi; Takeda, Atsushi; Arimoto, Shinobu; and Hasegawa, Shizuo, 4,985,760, Cl. 358-80.000.
Matsuoka, Hidetoshi; and Natsume, Masahito, 4,985,785, Cl. 360-62.000.
Mikami, Fumiyuki, 4,985,700, Cl. 341-59.000.
Nakazato, Horoshi; Iijima, Mamoru; and Nakamura, Akihiro, 4,984,953, Cl. 414-331.000.
Nose, Noriyuki; Nakajima, Toshiyuki; Kawakami, Eigo; Baba, Takeshi; Kushibiki, Nobuo; Matsugu, Masakazu; and Niwa, Yukichi, 4,985,186, Cl. 264-1.700.
Ogushi, Hiroshi, 4,985,617, Cl. 250-208.100.
Okamoto, Yoshifumi, 4,985,850, Cl. 364-519.000.
Sakashita, Kiichiro; Tanikawa, Hirohide; Yoshida, Satoshi; Nakahara, Toshiaki; Matsushige, Naoki; Fujiwara, Masatsugu; and Mitsuhashi, Yasuo, 4,985,327, Cl. 430-106.600.
Sekine, Kazumi; and Suwa, Kaname, 4,984,916, Cl. 400-613.100.
Tada, Tatsuya; and Yamamoto, Yasuyoshi, 4,985,823, Cl. 346-160.100.
Capriotti, Janice D.: *See—*
Feller, Roger K.; Warner, Samuel R.; and Capriotti, Janice D., 4,984,454, Cl. 73-117.300.
Carder, Norman G.: *See—*
Rhind, William G.; and Carder, Norman G., 4,985,900, Cl. 375-10.000.
Cardia, Ennio. Dispensing container for a viscous fluid or solidified stick-shaped product, particularly for cosmetics. 4,984,718, Cl. 222-390.000.
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Napoletano, Mauro; and Sala, Alberto, to Zambon Group S.p.A. Isoxazoles with nootropic activity. 4,985,428, Cl. 514-252.000.
Carganico, Germano: *See—*
Cozzi, Paolo; Carganico, Germano; Severino, Dino; Lovisolo, Pierpaolo; and Chiari, Augusto, 4,985,440, Cl. 514-397.000.
Carl Freudenberg, Firma: *See—*
Kurr, Klaus; Eckel, Hans-Gerd; Seifert, Heinz; Idigkeit, Werner; and Barth, Armin, 4,984,777, Cl. 267-140.100.
Carondelet Foundry Company: *See—*
Culling, John H., 4,985,091, Cl. 148-325.000.
Carrier Corporation: *See—*
Esformes, Jack L.; and Ubowski, Lawrence W., 4,984,626, Cl. 165-151.000.
Gormley, Thomas P.; and Crofoot, James F., 4,984,480, Cl. 74-573.00R.
Mount, Gordon L.; and Cuny, James N., 4,984,431, Cl. 62-85.000.
Caruso, F. Gerald: *See—*
Langberg, Edwin; and Caruso, F. Gerald, 4,985,925, Cl. 381-72.000.
Caruso, Michele; Suarato, Antonino; Angelucci, Francesco; and Arcamone, Federico, to Farmitalia Carlo Erba S.R.L. 4-demethoxy-4-amino-anthracyclines. 4,985,548, Cl. 536-6.400.
Casale, Enzo. Lavatory pan seat. 4,984,310, Cl. 4-347.000.
Casida, John E.; and Elliott, Michael, to Wellcome Foundation Ltd., The; and University of California, The Regents of the. Dialkyl-substituted dithianes and pesticidal compositions. 4,985,411, Cl. 514-63.000.
Casio Computer Co., Ltd.: *See—*
Yamada, Wataru; Kido, Yukio; Abe, Hiroyuki; Minami, Shunji; Katoh, Shigeru; and Yano, Junro, 4,985,878, Cl. 368-88.000.
Cassella Aktiengesellschaft: *See—*
Buhler, Ulrich; Hahnke, Manfred; Kuhn, Reinhard; and Boos, Margarete, 4,985,043, Cl. 8-639.000.
Buhler, Ulrich; and Hofmann, Klaus, 4,985,045, Cl. 8-639.000.
Caterpillar Inc.: *See—*
Jensen, Brian D., 4,984,850, Cl. 299-37.000.
Catlin, Robert W., to Chips and Technologies, Inc. Memory controller for using reserved dram addresses for expanded memory space. 4,985,871, Cl. 365-230.060.
Caville, Christian: *See—*
Boisgontier, Jean Marc; and Caville, Christian, 4,984,866, Cl. 350-96.200.
Central Glass Company, Limited: *See—*
Furuya, Koichi; Nakashima, Hiroshi; Iida, Yasunobu; Takeuchi, Nobuyuki; and Nakamura, Masato, 4,985,312, Cl. 428-627.000.
Koishi, Toshio; Ootani, Mikio; Katsuragawa, Seichi; and Sueta, Hideaki, 4,985,519, Cl. 526-249.000.
Centre National d'Etudes des Telecommunications: *See—*
Fauchard, Pierre, 4,984,678, Cl. 198-443.000.
Centre Suisse d'Electronique et de Microtechnique SA: *See—*
Parriaux, Olivier; Neuman, Victor; and Voirin, Guy, 4,984,863, Cl. 350-96.110.
Centro Sviluppo Settori Impiego S.r.l.: *See—*
Addeo, Antonio; Bonvini, Alberto; Reggiani, Romano; and Vezzoli, Annibale, 4,985,303, Cl. 428-36.500.
Ceram-Sna Inc.: *See—*
Delvaux, Pierre; Desrosiers, Luc; and Gouin, Marcel, 4,985,164, Cl. 252-62.000.
Cerfontain, Hans: *See—*
Madison, Stephen A.; Ilardi, Leonora M.; and Cerfontain, Hans, 4,985,561, Cl. 544-158.000.
Cerlanek, John F., Jr.: *See—*
Campbell, Robert K.; Cerlanek, John F., Jr.; and Schwalbe, Kurt E., 4,985,928, Cl. 382-3.000.
Cerutti, David B., to General Electric Company. Supported thermally stable cubic boron nitride tool blanks and method for making the same. 4,985,050, Cl. 51-293.000.
Cesti, Pietro: *See—*
Bianchi, Daniele; Cesti, Pietro; and Golini, Paolo, 4,985,366, Cl. 435-280.000.
Cetus Corporation: *See—*
Zimmerman, Robert; and Marafino, Benedict J., Jr., 4,985,241, Cl. 424-85.100.
CFM Technologies Research Associates: *See—*
McConnell, Christopher F.; and Walter, Alan E., 4,984,597, Cl. 134-95.000.
Chabanne, Jean-Pierre: *See—*
Bedu, Guy; and Chabanne, Jean-Pierre, 4,984,847, Cl. 297-411.000.
Chaddock, James D., deceased; and Chaddock, Perry, executor, to Dow Chemical Company, The. Pesticide spray nozzle. 4,984,743, Cl. 239-559.000.
Chaddock, Perry, executor: *See—*
Chaddock, James D., deceased; and Chaddock, Perry, executor, 4,984,743, Cl. 239-559.000.
Chadwick, Kirk M.; and Halm, Roland L., to Dow Corning Corporation. Alkylation of silanes. 4,985,580, Cl. 556-481.000.
Chambers, Gary C.; and Brand, Ernest E., Jr. Carbonated beverage dispenser. 4,984,713, Cl. 222-105.000.
Champa, Anthony A.: *See—*
Zupancic, Anton Z.; Champa, Anthony A.; and Dobbs, John L., 4,984,774, Cl. 269-322.000.

Chang, Hsien-Hsin: *See*—
Singer, Norman; Wilcox, Reed; Podolski, Joseph S.; Chang, Hsien-Hsin; Pookote, Suseelan; Dunn, John M.; and Hatchwell, Leora, 4,985,270, Cl. 426-515.000.

Chang, I-Lin: *See*—
Peelle, H. E., Jr.; Chang, I-Lin; and Walkowiak, Stefan, 4,984,658, Cl. 187-58.000.

Chang, Keh-Minn; and Vasatis, Ioannis P., to General Electric Company. Generator rotor steels. 4,985,201, Cl. 420-109.000.

Chapoy, L. Lawrence: *See*—
Coassolo, Alfredo; Chapoy, L. Lawrence; Foa, Marco; and Sabarino, Giampiero, 4,985,533, Cl. 528-193.000.

Chapoy, Larry L.: *See*—
Fornasier, Roberto; Tornatore, Massimo; and Chapoy, Larry L., 4,985,539, Cl. 528-423.000.

Charpentier, Bruno; and Roques, Bernard P., to Institut National de la Sante et de La Recherche Medicale (INSERM). Peptides derived from CCK8, their preparation and the pharmaceutical compositions which contain them. 4,985,406, Cl. 514-11.000.

Charpiot, Brigitte; Greiner, Jacques; Le Blanc, Maurice; Manfredi, Alexandre; Riess, Jean; and Zarif, Leila, to Alliance Pharmaceutical Corp. Polyhydroxylated and highly fluorinated compounds, their preparation and their use as surfactants. 4,985,550, Cl. 536-18.400.

Chatsick, James J.; and Sipos, Peter A., to Du Pont Canada Inc. Method of making fiber reinforced polyamide sheets. 4,985,102, Cl. 156-163.000.

Chatterjee, Dilip K., to Eastman Kodak Company. Method of making anisotropic magnets. 4,985,085, Cl. 148-101.000.

Chemcut Corporation: *See*—
Ketelhohn, Karl F. G., 4,985,111, Cl. 156-640.000.

Chementecno S.r.l.: *See*—
Giobbio, Vincenzo; and Ambrosini, Leonardo, 4,985,549, Cl. 536-13.800.

Chen, Alan. Structure of binding clip. 4,984,925, Cl. 402-8.000.

Chen, Dennis C. Racket handle cap. 4,984,793, Cl. 273-75.000.

Chen, Shun-Le: *See*—
Yeung, Edward S.; and Chen, Shun-Le, 4,984,857, Cl. 350-6.600.

Chen, Ying-Fu. Electric fan cross-shaped base. 4,984,761, Cl. 248-188.700.

Chen, Yuan Yu G.: *See*—
Anderson, Albert G.; Hertler, Walter R.; Wheland, Robert C.; and Chen, Yuan Yu G., 4,985,332, Cl. 430-176.000.

Cheron, Jacques: *See*—
Rolland, Laurence; Bertoochio, Rene ; and Cheron, Jacques, 4,985,169, Cl. 252-69.000.

Chevron Research Company: *See*—
Graf, Peter E.; Agazzi, Steven J.; and Vanderzanden, Eugene J., 4,985,079, Cl. 106-502.000.

Chiang, Hsi-Shih. Ball game device. 4,984,809, Cl. 273-401.000.

Chiari, Augusto: *See*—
Cozzi, Paolo; Carganico, Germano; Severino, Dino; Lovisolo, Pierpaolo; and Chiari, Augusto, 4,985,440, Cl. 514-397.000.

Chiarino, Dario: *See*—
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Napoletano, Mauro; and Sala, Alberto, 4,985,428, Cl. 514-252.000.

Chiba, Tadahiro; Miyazawa, Kiyoshi; Uzuka, Makoto; and Suzuki, Takashi, to Shiseido Company Ltd. Dissolved composition of [benzo-1,2,4-thiadiazine]-1,1-dioxide. 4,985,425, Cl. 514-222.200.

Chikamori, Yoshihiro: *See*—
Shibata, Yoshihiko; Chikamori, Yoshihiro; and Shimizu, Youichi, 4,985,054, Cl. 55-178.000.

Chip, Gerald K.; and Rudin, Alfred, to Tioxide Group. Polymeric particles and their preparation. 4,985,469, Cl. 521-64.000.

Chips and Technologies, Inc.: *See*—
Catlin, Robert W., 4,985,871, Cl. 365-230.060.

Chitayat, Anwar. Linear motor with magnetic bearing preload. 4,985,651, Cl. 310-12.000.

Chiyoshi, Toyoharu: *See*—
Sugiura, Takashi; Matsuura, Ichiro; Miyauchi, Fumio; and Chiyoshi, Toyoharu, 4,985,189, Cl. 264-26.000.

Chlopek, Zdzislaw: *See*—
Toczyski, Zygmunt; Kruczynski, Stanislaw W.; Frackiewicz, Henryk; Lozinski, Janusz; Chlopek, Zdzislaw; Danilczyk, Wiktor; Ranachowski, Jerzy; Janula, Janusz; and Wolski, Lech, 4,984,550, Cl. 123-478.000.

Cho, Hyun J.; and Rankin, William J., to TDW Delaware, Inc. Elastomeric disc for use on a pipeline pig. 4,984,322, Cl. 15-104.061.

Cho, Soo Se, to Macho Products, Inc. Protective glove. 4,984,300, Cl. 2-18.000.

Choquette, Paul, to Corporation Salaison Melrose. Apparatus for cooking and shaping meat pieces. 4,984,513, Cl. 99-349.000.

Chou, Hsin-Hsin; Lamanna, William M.; and Wright, Robin E., to Minnesota Mining and Manufacturing Company. Thermal mass transfer of metallic images. 4,985,321, Cl. 430-38.000.

Choudhury, Alok, to Leybold Aktiengesellschaft. Process for producing superconductive ceramics by atomization of alloy precurser under reactive atmospheres or post annealing under oxygen. 4,985,400, Cl. 505-1.000.

Christ, Wilhelm, to Then Maschinen- und Apparatebau GmbH. Method or apparatus for treating textile fabric or goods. 4,984,317, Cl. 8-149.100.

Christodoulou, Leontios: *See*—
Moshier, William C.; Brupbacher, John M.; Christodoulou, Leontios; and Nagle, Dennis C., 4,985,202, Cl. 420-590.000.

Chu, Pochen; Herbst, Joseph A.; Klocke, Donald J.; and Vartuli, James, to Mobil Oil Corporation. Crystalline aluminosilicate. 4,985,223, Cl. 423-328.000.

Chui, K. Ming: *See*—
Gangarosa, Raymond E.; and Chui, K. Ming, 4,985,678, Cl. 324-318.000.

Clark, Joseph N.; and Smith, Schuyler B., to Dow Corning Corporation. Clear organosiloxane compositions. 4,985,525, Cl. 528-15.000.

Clark, Thomas C., to AMP Incorporated. Method of making a solder containing electrical connector. 4,984,359, Cl. 29-879.000.

Clarke, Richard: *See*—
Isner, Jeffrey M.; and Clarke, Richard, 4,985,028, Cl. 606-15.000.

Clarmatic Industries, Inc.: *See*—
Fox, Robert J.; and Hoodlebrink, Merlin P., 4,985,146, Cl. 210-413.000.

Clausen, Earl W.; and Hubbard, Lloyd C., to Minnesota Mining and Manufacturing Co. Centrifugal blood pump. 4,984,972, Cl. 417-420.000.

Claussen, Uwe; and Herrmann, Udo, to Bayer Aktiengesellschaft. Electrically conducting polyheteroaromatics and a process for their preparation. 4,985,124, Cl. 204-72.000.

Clauzure, Ande C., to Ricard, Pernod. Process for the preparation of an aqueous solution of organoleptic constituents and its application to obtaining colorless potable spirits of the whiskey type. 4,985,264, Cl. 426-330.400.

Clerici, Piero R. Stratiform product in sheet form for packaging purposes. 4,985,299, Cl. 428-314.400.

Cline, Harvey E.; Hartley, Richard I.; Ludke, Siegwalt; and Noujaim, Sharbel E., to General Electric Company. System and method employing pipelined parallel circuit architecture for displaying surface structures of the interior region of a solid body. 4,985,834, Cl. 364-413.220.

Cloete, Thomas E.: *See*—
Cronje, Izak J.; Dekker, Johannes; and Cloete, Thomas E., 4,985,150, Cl. 210-661.000.

Cloutier, Cathy A.: *See*—
Springer, Jack F., Jr.; Smith, Timothy S.; Cloutier, Cathy A.; Marcantonio, Ben A.; and Willis, Richard A., 4,984,571, Cl. 128-371.000.

Coassolo, Alfredo; Chapoy, L. Lawrence; Foa, Marco; and Sabarino, Giampiero, to Montedison S.p.A. Termotropic liquid-crystalline aromatic polyester from hydroquinone/substituted hydroquinone mixture. 4,985,533, Cl. 528-193.000.

Coates, Ian H.: *See*—
North, Peter C.; Oxford, Alexander W.; Coates, Ian H.; and Beswick, Paul J., 4,985,422, Cl. 514-215.000.

Codar Technology, Inc.: *See*—
Campbell, W. Carroll; Evans, Michael W.; Browning, Edward A., Jr.; and Stone, Robert J., 4,985,804, Cl. 361-384.000.

Cody, Ian A.; and Hamner, Glen P., to Exxon Research and Engineering Company. Surface silylated zeolite catasysts, and processes for the preparation, and use of said catalysts in the production of high octane gasoline. 4,985,135, Cl. 208-114.000.

Cogno, Pietro, to RIV-SKF Officine Di Villar Perosa S.p.A. Adjustable spacer, particularly for rolling bearings, and support assembly implementing the same. 4,984,910, Cl. 384-563.000.

Cohen, Herve ; and Fouillet, Jean-Marie, to Telediffusion de France. Method and device for evaluating the safety margin of a digital video signal. 4,985,901, Cl. 375-10.000.

Cohen, Itzchak, to Lambda Electronics Inc. Indirect current sensing of DC to DC converters. 4,985,821, Cl. 363-95.000.

Cohen, Todd J., to Bloom, Leonard, a part interest. Hemodynamically responsive system for and method of treating a malfunctioning heart. 4,984,572, Cl. 128-419.00D.

Cohn, Arnold K.; and Elterman, Charles W. Dual-use holder for pocket-sized electronic appliance or the like. 4,984,760, Cl. 248-126.000.

Coindreau-Palau, Damaso. Method and system for the recovering of solvents in dry cleaning machines. 4,984,318, Cl. 8-158.000.

Cole, Robert, to Wen-Don Corporation. Dewatering composition. 4,985,162, Cl. 252-60.000.

Collins, Harry F.: *See*—
King, Frederick M.; and Collins, Harry F., 4,984,690, Cl. 206-503.000.

Collins, Warde T.; Cottrell, Kenneth R.; and Saam, John C., to Dow Corning Corporation. Method of producing treated silica filler for silicone rubber. 4,985,477, Cl. 523-212.000.

Colman, Margaret M. Lighted embroidery hoop apparatus. 4,984,378, Cl. 38-102.200.

Coltec Industries Inc.: *See*—
Mesenich, Gerhard, 4,984,549, Cl. 123-472.000.

Columbia University in the City of New York, The Trustees of: *See*—
Julius, David J.; Axel, Richard; and Jessell, Thomas M., 4,985,352, Cl. 435-6.000.

Comas S.p.A.: *See*—
Bragaglia, Giorgio, 4,984,491, Cl. 83-338.000.

Combi Co., Ltd.: *See*—
Takahashi, Takehiko; Saito, Hideo; Watanabe, Takashi; and Kaneko, Tomihioro, 4,984,813, Cl. 280-30.000.

ComCo Systems: *See*—
Foreman, Michael J.; and Greene, Harold R., 4,984,939, Cl. 406-84.000.

Comfortex Corporation: *See*—
Corey, John A., 4,984,617, Cl. 160-84.100.

Communications Systems, Inc.: *See*—
Zernov, Jeffrey P., 4,985,808, Cl. 361-406.000.

Computer Instruments Corporation: *See—*
Wilen, Don J.; and Cooper, Frank, 4,984,451, Cl. 73-53.000.
Conair Corporation: *See—*
Jacobi, Gerald M., 4,984,591, Cl. 132-229.000.
Conner, Dorothea H.: *See—*
Conner, John A.; and Conner, Dorothea H., 4,984,684, Cl. 206-315.300.
Conner, John A.; and Conner, Dorothea H. Award-designation apparatus for a golf club bag and the like. 4,984,684, Cl. 206-315.300.
Conner Peripherals, Inc.: *See—*
Anderson, Kurt M., 4,985,793, Cl. 360-105.000.
Connor, Frederick D., to Ford Motor Company. Ball joint stud assembly. 4,984,930, Cl. 403-290.000.
Conroy, Walter J.; and Katona, William, to SCI Systems, Inc. Component location device and method for surface-mount printed circuit boards. 4,985,107, Cl. 156-299.000.
Consortium fur Elektrochemische Industrie GmbH: *See—*
Kratel, Gunter; and Katzer, Hans, 4,985,163, Cl. 252-62.000.
Conti, Franco, to Etablissement Texcontor. Quaternary ammonium salts of polysaccharides, prossessing hypocholesterolemic activity. 4,985,410, Cl. 514-54.000.
Continental Can Company, Inc.: *See—*
Pfaffmann, George D.; Kubis, Charles S.; Currie, John P.; Balzer, Norbert R.; Walter, John; and Adams, Graham R., 4,984,414, Cl. 53-478.000.
Cook Incorporated: *See—*
Fearnot, Neal E.; Hawkins, Melvin K.; and Sisken, Richard B., 4,985,022, Cl. 604-282.000.
Cook, Mark A., to United States of America, Air Force. Ammunition casing extractor. 4,984,500, Cl. 86-1.100.
Cooper, Anthony W. J.: *See—*
Foxton, Michael W.; Ayres, Barry E.; and Cooper, Anthony W. J., 4,985,407, Cl. 514-19.000.
Cooper, Frank: *See—*
Wilen, Don J.; and Cooper, Frank, 4,984,451, Cl. 73-53.000.
Cooper-Hart, Michael A.: *See—*
Emmons, Lawrence D.; Mackley, James S.; Stokes, David H.; Stefenel, Rudolph S.; Brisko, William E., Jr.; and Cooper-Hart, Michael A., 4,985,911, Cl. 379-53.000.
Cooper Industries, Inc.: *See—*
Saunders, Brian, 4,984,830, Cl. 285-368.000.
Cooper-Joselow, Alice H.: *See—*
Agarwala, Birendra N.; Beckman, Keith F.; Cooper-Joselow, Alice H.; Narayan, Chandrasekhar; Purushothaman, Sampath; and Ray, Sudipta K., 4,985,310, Cl. 428-620.000.
Copal Company Limited: *See—*
Matsushima, Jun; Kageyama, Tetsuto; Nakamura, Shigekazu; and Wakazono, Kenji, 4,984,474, Cl. 73-862.330.
Copella, Robert A.: *See—*
Pease, Kevin J.; Copella, Robert A.; and Flannery, Ann M., 4,985,614, Cl. 235-440.000.
Cordier, Andre: *See—*
Patte, Philippe; and Cordier, Andre, 4,985,056, Cl. 55-240.000.
Core Medical Corporation: *See—*
Dutton, Virgil R., 4,984,530, Cl. 118-43.000.
Corey, John A. Ericsson cycle machine. 4,984,432, Cl. 62-87.000.
Corey, John A., to Comfortex Corporation. Enveloped blind assembly using independently actuated slats within a cellular structure. 4,984,617, Cl. 160-84.100.
Corporation Limited Rioko: *See—*
Higa, Teruo, 4,985,060, Cl. 71-6.000.
Corporation Salaison Melrose: *See—*
Choquette, Paul, 4,984,513, Cl. 99-349.000.
Corry, Michael K.: *See—*
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,985,848, Cl. 364-518.000.
Cosgrove, Raymond F.: *See—*
Bowman, David J.; Cosgrove, Raymond F.; Male, Terence P.; and Evans, Robert, 4,985,206, Cl. 422-99.000.
Cosmo, Guy, to K. C. Technical Services, Inc. Machine and method for overwrapping cylindrical articles. 4,984,413, Cl. 53-465.000.
Coste, Denis. Plow with symmetrical bodies having concave vertical and horizontal cross-sections. 4,984,638, Cl. 172-221.000.
Cotton Incorporated: *See—*
Wilkes, Lambert H.; Mehner, Martin; and Lalor, William F., 4,984,334, Cl. 19-48.00R.
Cottrell, Kenneth R.: *See—*
Collins, Warde T.; Cottrell, Kenneth R.; and Saam, John C., 4,985,477, Cl. 523-212.000.
Courty, Philippe: *See—*
Prigent, Michel; Blanchard, Gilbert; Garreau, Francois; and Courty, Philippe, 4,985,387, Cl. 502-304.000.
Cousins, Terence: *See—*
Hayward, Alan T. J.; and Cousins, Terence, 4,984,470, Cl. 73-861.220.
Cox, Ronald L., to McDonnell Douglas Corporation. Method for attaching a doubler to a skin structure. 4,984,347, Cl. 29-402.060.
Cox, William C., III: *See—*
Hartung, Joe; and Cox, William C., III, 4,984,757, Cl. 244-137.400.
Cozzi, Paolo; Carganico, Germano; Severino, Dino; Lovisolo, Pierpaolo; and Chiari, Augusto, to Farmitalia Carlo Erba, S.r.l. Hypolipidaemic imidazol-2-yl-derivatives of bicyclic compounds. 4,985,440, Cl. 514-397.000.
Crawford, Paul A.; and Hall, James E., to Dana Corporation. Gear drive unit with equalized shift. 4,984,478, Cl. 74-372.000.
Cray Research, Inc.: *See—*
Neumann, Eugene F.; August, Melvin C.; and Bowen, Stephen A., 4,984,993, Cl. 439-157.000.
Creative Packaging Corporation: *See—*
Beck, James M., 4,984,716, Cl. 222-153.000.
Crinos Industria Farmacobiologica S.p.A.: *See—*
Fedeli, Gianfranco; Diamantini, Giuseppe; Maontovani, Marisa; and Prino, Giuseppe, 4,985,552, Cl. 536-27.000.
Critchley, Richard J.; and Oldham, Samuel R., to British Nuclear Fuels Plc. System for posting articles into a containment. 4,984,510, Cl. 98-1.000.
Crofoot, James F.: *See—*
Gormley, Thomas P.; and Crofoot, James F., 4,984,480, Cl. 74-573.00R.
Croft, Thomas S.; and Haugen, Hartwick, to Minnesota Mining and Manufacturing. Encapsulant compositions for use in signal transmission devices. 4,985,475, Cl. 523-173.000.
Cronje, Izak J.; Dekker, Johannes; and Cloete, Thomas E., to National Energy Council. Water treatment using oxidized coal. 4,985,150, Cl. 210-661.000.
Cronk, John E. Vehicle windshield wiper light circuit. 4,985,660, Cl. 315-82.000.
Croteau, Dianne: *See—*
Brault, Richard; Croteau, Dianne; and Vinden, Jonathan, 4,984,987, Cl. 434-265.000.
Crowe, Lawrence E.; and Sutrina, Thomas A., to Sundstrand Corporation. Hermetically sealed compression bonded circuit assembly having a suspension for compression bonded semiconductor elements. 4,985,752, Cl. 357-79.000.
Crowley, Christopher T.: *See—*
Thorne, Jonathan O.; and Crowley, Christopher T., 4,985,055, Cl. 55-189.000.
Crowley, John L.; Kermani, Ahmad; Lassig, Stephan E.; Johnson, Noel H.; and Rickords, Gary R., to Peak Systems, Inc. Apparatus and method for compensating for errors in temperature measurement of semiconductor wafers during rapid thermal processing. 4,984,902, Cl. 374-1.000.
Cruzen, Gerald S., to Williams International Corporation. Propfan blade erection damper. 4,984,967, Cl. 416-140.000.
Csizer, Eva: *See—*
Kreidl, Janos; Turcsanyi, Peter; Arcs nee Trischler, Zsuzsanna; Stefko, Bela; Meszaros nee Brill, Judit M.; Deutsch nee Juhasz, Ida; Szilbereky, Jeno ; Csizer, Eva; and Vezer, Szilard, 4,985,463, Cl. 514-646.000.
Cubranich, Ladislaw D.: *See—*
Lubrano, Rocco V.; and Cubranich, Ladislaw D., 4,984,355, Cl. 29-741.000.
Cullick, Alvin S.; and Hazlett, Randy D., to Mobil Oil Corporation. Thermal barriers for enhanced oil recovery. 4,984,635, Cl. 166-261.000.
Culling, John H., to Carondelet Foundry Company. Corrosion resistant duplex alloys. 4,985,091, Cl. 148-325.000.
Cultured Foods Corporation: *See—*
Rosen, Charles A., 4,985,258, Cl. 426-8.000.
Cummins, Susan. Eyeglass holder. 4,984,682, Cl. 206-5.000.
Cuny, James N.: *See—*
Mount, Gordon L.; and Cuny, James N., 4,984,431, Cl. 62-85.000.
Curley, John J., Jr.; Yang, Jui-Chiung; and Yeh, Tzu-Hung, to Foot-Joy, Inc. Shoe sole embossed composition and method. 4,984,320, Cl. 12-146.0BR.
Curley, Michael G., to Massachusetts Institute of Technology. In situ polarographic sensor calibration. 4,985,123, Cl. 204-153.100.
Currie, John P.: *See—*
Pfaffmann, George D.; Kubis, Charles S.; Currie, John P.; Balzer, Norbert R.; Walter, John; and Adams, Graham R., 4,984,414, Cl. 53-478.000.
Curry, Roger W.: *See—*
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,984,417, Cl. 56-11.300.
Curtis, Jerry: *See—*
Struthers, Scott; Curtis, Jerry; and Reed, Jack, 4,984,931, Cl. 403-362.000.
Cyclofil (Proprietary) Limited: *See—*
Prinsloo, Willem J. C.; De Villiers, Pierre; and Van Dijken, Marten C., 4,985,058, Cl. 55-457.000.
Cyphert, David L.; and Robertson, John A., to Telesis Controls Corporation. Marker assembly for spray marking dot matrix characters and method of fabrication thereof. 4,985,715, Cl. 346-140.00R.
Daghe, Joe L.; Eckel, John D.; and Heidbrier, Warren G., to A. Y. McDonald Mfg. Co. Tamperproof rotary valve. 4,984,767, Cl. 251-297.000.
Dahlin, Erik B., to Exac Corporation. Apparatus for mass flow rate and density measurement. 4,984,472, Cl. 73-861.380.
Dahrendorf, Klaus D.; and Noack, Ulrich, to Auergesellschaft GmbH. Air conveyor for gas-sampling tubes. 4,984,476, Cl. 73-864.350.
Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Deguchi, Hisashi, 4,985,466, Cl. 514-724.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Ishii, Tohru; Asahi, Koichi; and Yamaguchi, Masahisa, 4,984,823, Cl. 283-81.000.
Umise, Shigeki; and Imamura, Hirokatsu, 4,985,292, Cl. 428-194.000.
Daiichi Pharmaceutical Co., Ltd.: *See—*
Miki, Tosaku; Asano, Masahide; and Hosokami, Toru, 4,985,595, Cl. 564-157.000.

Daiichi Seiyaku Co., Ltd.: *See*—
Hayakawa, Isao; Atarashi, Shohgo; Imamura, Masazumi; Yokohama, Shuichi; Higashihashi, Nobuyuki; Sakano, Katsuichi; and Ohshima, Masayuki, 4,985,557, Cl. 540-598.000.

Daikin Industries, Inc.: *See*—
Tamaru, Shinji; Kubo, Motonobu; Tanaka, Osamu; and Kobayashi, Tsutomu, 4,985,297, Cl. 428-260.000.

Daikin Industries, Ltd.: *See*—
Ohmure, Yukio; Kashiwagi, Hiroshi; Fujiwara, Katsuki; Tsuchiya, Tatsumi; and Aoyama, Hirokazu, 4,985,168, Cl. 252-67.000.
Tohzuka, Takashi; Kataoka, Yoshiaki; Ishikawa, Sueyoshi; and Fujiwara, Koji, 4,985,161, Cl. 252-54.000.

Daimler-Benz AG: *See*—
Grosch, Lothar; Zeidler, Falk; Katz, Egon; and Bossenmaier, Alban, 4,984,651, Cl. 180-268.000.
Kessler, Rudolf; Degen, Winfried; Oelkrug, Dieter; and Tubach, Martin, 4,985,622, Cl. 250-226.000.

Daimler-Benz Aktiengesellschaft: *See*—
Bauer, Theodor; Zweigart, Gerhard; and Gramer, Kurt, 4,984,841, Cl. 296-118.000.

Dainippon Ink and Chemicals, Inc.: *See*—
Azami, Kyoichiro; and Kume, Shouji, 4,985,322, Cl. 430-49.000.
Kobayashi, Nobuo; Yamamoto, Hisaomi; and Umehara, Kiyoshi, 4,985,307, Cl. 428-413.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Kondo, Noriyuki, 4,984,894, Cl. 356-382.000.
Masuda, Yoshihiro; Yagi, Takashi; and Nishimura, Eiji, 4,985,720, Cl. 354-299.000.

Dairei Co. Ltd.: *See*—
Seino, Toshio; and Tatsumi, Norio, 4,984,435, Cl. 62-434.000.

Daito Koeki Kabushiki Kaisha: *See*—
Shimizu, Keisuke; Matsumura, Takumi; and Nakamoto, Masato, 4,985,456, Cl. 514-467.000.

Dallas Semiconductor Corporation: *See*—
Faraci, Anthony B., 4,985,870, Cl. 365-228.000.

Daly, Daniel T.: *See*—
Sung, Rodney L.; and Daly, Daniel T., 4,985,047, Cl. 44-433.000.

Damle, Shridhar P.: *See*—
Fillit, Howard; Damle, Shridhar P.; Zabriskie, John; and Gregory, John D., 4,985,542, Cl. 530-395.000.

Damrath, Volker: *See*—
Wittmann, Dieter; Eckel, Thomas; Ott, Karl-Heinz; Damrath, Volker; and Westeppe, Uwe, 4,985,492, Cl. 525-63.000.

Dana Corporation: *See*—
Crawford, Paul A.; and Hall, James E., 4,984,478, Cl. 74-372.000.

Dana Farber Cancer Institute, Inc.: *See*—
Teicher, Beverly A., 4,985,416, Cl. 514-150.000.

Dana Innovations: *See*—
Struthers, Scott; Curtis, Jerry; and Reed, Jack, 4,984,931, Cl. 403-362.000.

Dandreaux, Gary: *See*—
Login, Robert B.; Merianos, John J.; Dandreaux, Gary; and Shih, Jenn S., 4,985,521, Cl. 526-264.000.

Danilczyk, Wiktor: *See*—
Toczyski, Zygmunt; Kruczynski, Stanislaw W.; Frackiewicz, Henryk; Lozinski, Janusz; Chlopek, Zdzislaw; Danilczyk, Wiktor; Ranachowski, Jerzy; Janula, Janusz; and Wolski, Lech, 4,984,550, Cl. 123-478.000.

Darigo, Julius: *See*—
Hagewood, John F.; and Darigo, Julius, 4,984,341, Cl. 28-185.000.

Davidson, Robert P.; and Rose, Richard A., to Motorola, Inc. Active load impedance control system for radio frequency power amplifiers. 4,985,686, Cl. 330-124.00R.

Davies, Lawrence W., to Omniglass Ltd. Sash window arrangement. 4,984,402, Cl. 52-398.000.

Davis, Thomas W.: *See*—
Ottman, Rick; Wiberg, Don; Johnson, Jack; Wanke, Thomas S.; and Davis, Thomas W., 4,984,989, Cl. 434-401.000.

Davis, Wilbur M.: *See*—
Buss, Rick A.; and Davis, Wilbur M., 4,985,031, Cl. 606-82.000.

Dawson, Geoffrey G.; and Ridley, Gordon, to Procter & Gamble Company, The. In beta-phase bar form containing soap, high HLB nonionic surfactant, and water-soluble polymer. 4,985,170, Cl. 252-117.000.

Dayco Products, Inc.: *See*—
Henderson, Dewey D., 4,985,010, Cl. 474-135.000.

Dayton Superior Corporation: *See*—
Baldino, Michael, 4,984,401, Cl. 52-378.000.

de la Haye, Cornelis F., to Koppens Automatic Fabrieken B.V. Automatic shut-off liquid delivery nozzle. 4,984,612, Cl. 141-198.000.

De Virgilio John J.: *See*—
Narula, Anubhav P. S.; and De Virgilio John J., 4,985,402, Cl. 512-6.000.

DeBack, James A. Golf swing muscle strengthener and swing developer device. 4,984,801, Cl. 273-186.00A.

DeBiasse, Richard L. Lubricating means for pin connected relatively rotatable engine part and method of lubrication. 4,984,544, Cl. 123-197.0AC.

De Courcy, David R.: *See*—
Barker, Sidney A.; Baggett, Neil; Stevenson, John; George, Raymond D.; De Courcy, David R.; Hammond, Timothy; and Bradley, Martin, 4,985,489, Cl. 524-594.000.

de Croot, Paul: *See*—
Vieux, Gerard; and de Croot, Paul, 4,985,633, Cl. 250-486.100.

De Cuadros, Graciela. Method of producing dried food. 4,985,267, Cl. 426-473.000.

Deere & Company: *See*—
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,984,417, Cl. 56-11.300.
Kaczmarczyk, Edward T., 4,984,958, Cl. 414-723.000.

Degen, Paul: *See*—
Zeiss, Karl R.; and Degen, Paul, 4,985,276, Cl. 427-136.000.

Degen, Winfried: *See*—
Kessler, Rudolf; Degen, Winfried; Oelkrug, Dieter; and Tubach, Martin, 4,985,622, Cl. 250-226.000.

de Goys de Mezeyrac, Charles; Fugier, Roger; Giquel, Bernard; and Tetard, Serge, to Isover Saint-Gobain. Composition for gumming mineral fibers and gummed mineral fibers. 4,985,482, Cl. 524-215.000.

Deguchi, Hisashi, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Method for treating tumors susceptible to treatment with reduced wool alcohol. 4,985,466, Cl. 514-724.000.

Deguchi, Katsuhiko: *See*—
Tosaka, Masaki; Kawano, Haruki; and Deguchi, Katsuhiko, 4,985,177, Cl. 252-547.000.

Degussa: *See*—
Eckert, Wolfgang, 4,984,610, Cl. 141-5.000.

Dehne, Clarence A.; and Ellens, Daniel S., to Jervis B. Webb Company. Self-propelled trolley and supporting track structure. 4,984,523, Cl. 105-155.000.

De Jong, Fokke M.: *See*—
Habraken, Nicolaas J.; Van Randen, Age; De Vries, Franciscus; and De Jong, Fokke M., 4,984,408, Cl. 52-741.000.

Deki, Shigehito: *See*—
Hashimoto, Noboru; Sawada, Yasushi; Yoden, Hiroyoshi; Deki, Shigehito; and Takahashi, Hisamitsu, 4,985,225, Cl. 423-412.000.

Dekker, Johannes: *See*—
Cronje, Izak J.; Dekker, Johannes; and Cloete, Thomas E., 4,985,150, Cl. 210-661.000.

De Koning, Jan J.: *See*—
Verweij, Jan; De Koning, Jan J.; and Witkamp, Hendrik A., 4,985,554, Cl. 540-215.000.

DeLand, Daniel L., to Masco Industries, Inc. Powered closing assist mechanism for vehicle doors or lid members. 4,984,385, Cl. 49-280.000.

DeLavallade, Annette. Jewelry box. 4,984,854, Cl. 312-330.100.

Della Bella, Davide: *See*—
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Napoletano, Mauro; and Sala, Alberto, 4,985,428, Cl. 514-252.000.

Delvaux, Pierre; Desrosiers, Luc; and Gouin, Marcel, to Ceram-Sna Inc. Forsterite and its use as insulating material. 4,985,164, Cl. 252-62.000.

De Mari, Daniel, to APR Composants. Encoding device particularly for integrated circuit cards. 4,985,807, Cl. 361-405.000.

Demizu, Yuzo: *See*—
Satoh, Shuichi; Tsuji, Kazuwo; Nakashima, Takeru; Yazu, Shuji; Nisida, Yosio; Muro, Kiyofumi; Demizu, Yuzo; Nakagawa, Masuo; and Okada, Moritami, 4,985,226, Cl. 423-446.000.

Demuth, Robert, to Rieter Machine Works, Ltd. Grinding device and method for grinding card clothing. 4,984,395, Cl. 51-242.000.

den Hartog, Huibert W.: *See*—
Van Perlstein, Erik B.; and den Hartog, Huibert W., 4,985,090, Cl. 148-320.000.

den Hartog, Jacobus A. J.; van Stuivenberg, Herman H.; and van Wijngaarden, Ineke, to Duphar International Research B.V. New 1,4-diazepine derivatives having anit-ulcer activity. 4,985,423, Cl. 514-219.000.

Dentatus International AB: *See*—
Edwardson, Svante R., 4,984,985, Cl. 433-123.000.

de Oliveira Filho, Florencio; and Pires, Valtair P. L., to Petroleo Brasileiro S.A. -Petrobras; and Empresa de Portos do Brasil S.A. -Portobras. Floating enclosed offshore support structure. 4,984,935, Cl. 405-224.000.

Dereims, Philippe: *See*—
Letemps, Bernard; and Dereims, Philippe, 4,985,059, Cl. 65-62.000.

De Rossett, Thomas, Jr. Method for etching glass. 4,985,115, Cl. 156-654.000.

Derr, W. Rodman, Jr.; Owens, Peter J.; and Sarli, Michael S., to Mobil Oil Corporation. Production of gasoline and distillate fuels from light cycle oil. 4,985,134, Cl. 208-89.000.

Derrien, Michel, to Messier-Hispano-Bugatti. Aircraft landing gear having wheels that swivel while the landing gear is being retracted. 4,984,755, Cl. 244-102.0SS.

Desbiolles, Jack: *See*—
Pernelle, Andre; and Desbiolles, Jack, 4,984,794, Cl. 273-80.100.

Desrosiers, Luc: *See*—
Delvaux, Pierre; Desrosiers, Luc; and Gouin, Marcel, 4,985,164, Cl. 252-62.000.

Dessert, Robert A.: *See*—
Montgomery, Robert M.; Dessert, Robert A.; and Punater, Dinesh G., 4,984,458, Cl. 73-159.000.

Deutsch nee Juhasz, Ida: *See*—
Kreidl, Janos; Turcsanyi, Peter; Arcs nee Trischler, Zsuzsanna; Stefko, Bela; Meszaros nee Brill, Judit M.; Deutsch nee Juhasz, Ida; Szilbereky, Jeno; Caizer, Eva; and Vezer, Szilard, 4,985,463, Cl. 514-646.000.

De Villiers, Pierre: *See*—
Prinsloo, Willem J. C.; De Villiers, Pierre; and Van Dijken, Marten C., 4,985,058, Cl. 55-457.000.

DeVita, Vincent A., to Fuel Tech, Inc. Process and injector for reducing the concentration of pollutants in an effluent. 4,985,218, Cl. 423-235.000.

DeVoe, Robert J.: *See*—
Palazzotto, Michael C.; and DeVoe, Robert J., 4,985,340, Cl. 430-270.000.

De Vries, Franciscus: *See*—
Habraken, Nicolaas J.; Van Randen, Age; De Vries, Franciscus; and De Jong, Fokke M., 4,984,408, Cl. 52-741.000.

Dhein, Rolf: *See*—
Mussig, Bernhard; Meyer, Rolf-Volker; Dhein, Rolf; and Brassat, Bert, 4,985,508, Cl. 525-420.500.

Diafoil Company, Limited: *See*—
Fukuda, Yajiro; and Utsumi, Shigeo, 4,985,538, Cl. 528-305.000.
Utsumi, Shigeo; Kotani, Tomoyuki; and Tomitaka, Kichinojo, 4,985,537, Cl. 528-272.000.

Diamantini, Giuseppe: *See*—
Fedeli, Gianfranco; Diamantini, Giuseppe; Maontovani, Marisa; and Prino, Giuseppe, 4,985,552, Cl. 536-27.000.

Dickson, Sandra L. Educational method, reusable educational bookmarking device and writing instrument clip. 4,984,529, Cl. 116-234.000.

Didier-Werke AG: *See*—
Bruckner, Raimund; Eschner, Axel; Langenfeld, Wilhelm; Oberbach, Manfred; Rothfuss, Hans; and Stusser, Dieter, 4,984,769, Cl. 266-44.000.

Di Domenico, Nicholas F.: *See*—
Uffenheimer, Kenneth F.; Di Domenico, Nicholas F.; and Weitz, Stephen L., 4,984,475, Cl. 73-864.220.

Diesel Kiki Co., Ltd.: *See*—
Koyama, Hiroshi; Kondo, Masami; and Kawahara, Hiroshi, 4,984,455, Cl. 73-118.100.

Digby, Kevin C. Denture brush device. 4,984,323, Cl. 15-104.920.

Digital Equipment Corporation: *See*—
Grondalski, Robert S., 4,985,832, Cl. 364-200.000.
Webb, David A., Jr.; Fite, David B.; Hetherington, Ricky C.; McKeen, Francis X.; Firstenberg, Mark A.; Murray, John E.; Manley, Dwight P.; Salett, Ronald M.; and Fossum, Tryggve, 4,985,825, Cl. 364-200.000.

Dionesotes, Neil T.: *See*—
Wilson, David T.; Dionesotes, Neil T.; and Roman, Paul F., 4,985,195, Cl. 264-320.000.

Dionne, Gervais: *See*—
Sabb, Annmarie L.; Abou-Gharbia, Magid A.; and Dionne, Gervais, 4,985,560, Cl. 544-115.000.

Dipert, Dwight D.: *See*—
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,985,848, Cl. 364-518.000.

Dise, Houston J. Load support assembly for pickup truck. 4,984,837, Cl. 296-3.000.

Dixon, Dale D.: *See*—
Burgoyne, William F., Jr.; and Dixon, Dale D., 4,985,159, Cl. 252-50.000.

Dobashi, Akihiko: *See*—
Ohta, Tomohisa; Hagiwara, Hiroyuki; Kanbara, Hisashige; Dobashi, Akihiko; and Seki, Yasuyuki, 4,985,471, Cl. 522-27.000.

Dobbs, John L.: *See*—
Zupancic, Anton Z.; Champa, Anthony A.; and Dobbs, John L., 4,984,774, Cl. 269-322.000.

Dr. Ing. h.c.F. Porsche AG: *See*—
Achleitner, August, 4,984,818, Cl. 280-701.000.

Doi, Hajime, to Hitachi Maxell, Ltd. Disk cartridge with improved disk cleaning. 4,985,799, Cl. 360-133.000.

Domer, Michel, to Hutchinson. Resilient joint with differentiated radial stiffness. 4,984,928, Cl. 403-228.000.

Dominke, Peter, to Robert Bosch GmbH. Antilock braking system. 4,985,839, Cl. 364-426.020.

Doolittle, Leonard L. Brace for scaffolding plank. 4,984,656, Cl. 182-222.000.

Doran, John: *See*—
Garnier, Steven F.; and Doran, John, 4,985,780, Cl. 358-299.000.

Dorsam, Thomas: *See*—
Gotz, Eckart; Lerch, Hans-Reter; Dorsam, Thomas; Schweigert, Gerhard; Wittmann, Werner; and Korner, Michael, 4,985,845, Cl. 364-492.000.

Doublet, Luc. Method of multicolor printing a material. 4,984,517, Cl. 101-470.000.

Douden, David K., to Minnesota Mining and Manufacturing. Method of making thin refractory flakes. 4,985,380, Cl. 501-128.000.

Douglas, Frank A. Portable container for elongated elements. 4,984,685, Cl. 206-334.000.

Dover Japan, Inc.: *See*—
Kuwabara, Tsuneo; and Miyazaki, Jingo, 4,984,811, Cl. 277-3.000.

Dow Chemical Company: *See*—
Blank, Lynne M. B.; Boyce, Thomas D.; and White, William C., 4,985,023, Cl. 604-360.000.
Chaddock, James D., deceased; and Chaddock, Perry, executor, 4,984,743, Cl. 239-559.000.

Dow Corning Corporation: *See*—
Baney, Ronald H.; Bilgrien, Carl J.; Fiedler, Lawrence D.; and Lee, Chi-long, 4,985,565, Cl. 548-110.000.
Blank, Lynne M. B.; Boyce, Thomas D.; and White, William C., 4,985,023, Cl. 604-360.000.
Bokerman, Gary N.; Hampton, James E.; and Uhlmann, John G., 4,985,579, Cl. 556-466.000.
Chadwick, Kirk M.; and Halm, Roland L., 4,985,580, Cl. 556-481.000.
Clark, Joseph N.; and Smith, Schuyler B., 4,985,525, Cl. 528-15.000.
Collins, Warde T.; Cottrell, Kenneth R.; and Saam, John C., 4,985,477, Cl. 523-212.000.
Halloran, Daniel J., 4,985,240, Cl. 424-71.000.
Wright, Antony P., 4,985,274, Cl. 427-38.000.

Dow Corning S.A.: *See*—
Trego, Brian R., 4,985,578, Cl. 556-457.000.

Dowdy, John C.; and Drake, Sheldon C. Ball mark repair tool. 4,984,790, Cl. 273-32.00B.

Dowell Schlumberger Incorporated: *See*—
Pilla, Jacques, 4,984,634, Cl. 166-250.000.
Sampa, Augdon; and Thomeer, Bart, 4,984,632, Cl. 166-237.000.

Dowler, Norman A.: *See*—
Sanderson, Ronald D.; Dowler, Norman A.; and Van Reenen, Albert J., 4,985,145, Cl. 210-321.750.

Dragerwerk Aktiengesellschaft: *See*—
Albarda, Scato; Frank, Helge; and Marcoll, Joachim, 4,985,165, Cl. 252-62.540.

Drake, Donald J.; and Hawkins, William G., to Xerox Corporation. Buttable subunits for pagewidth "Roofshooter" printheads. 4,985,710, Cl. 346-1.100.

Drake, Sheldon C.: *See*—
Dowdy, John C.; and Drake, Sheldon C., 4,984,790, Cl. 273-32.00B.

Drejer, Jorgen; and Jakobsen, Palle, to A/S Ferrosan. Piperidine compounds and pharmaceutical compositions thereof. 4,985,446, Cl. 514-321.000.

Dressel, Thomas D. Soft tissue aspiration device and method. 4,985,027, Cl. 606-15.000.

Dresser Industries: *See*—
Woollatt, Derek; and Safford, George J., 4,984,361, Cl. 29-890.124.

Dreux, Maurice. Process and machine for harvesting fruits or similar items scattered on the ground. 4,984,421, Cl. 56-328.100.

Drilex Systems, Inc.: *See*—
Bailey, Thomas F.; and Strickland, James N., 4,984,636, Cl. 166-277.000.

Droescher, Michael: *See*—
Schueler, Ralf; Muegge, Joachim; Droescher, Michael; Bartz, Wilfried; and Feinauer, Roland, 4,985,494, Cl. 525-67.000.

Druppel, Johannes; and Schlagbohmer, Hermann, to M.A.N. Maschinenfabrik Augsburg-Nuremberg AG. Heating system for steel casting ladles. 4,984,771, Cl. 266-142.000.

Du Pont Canada Inc.: *See*—
Chatsick, James J.; and Sipos, Peter A., 4,985,102, Cl. 156-163.000.

Dubal, Hans-Rolf: *See*—
Wingen, Rainer; Dubal, Hans-Rolf; Hemmerling, Wolfgang; Muller, Ingrid; and Ohlendorf, Dieter, 4,985,172, Cl. 252-299.670.

Duboc, Soraya; Renon, Henri; Laugier, Serge; Mizandjian, Jean-Luc; and Pean, Jean-Louis, to L'Air Liquide, Society Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for extraction of spices. 4,985,265, Cl. 426-425.000.

Duckworth, Stephen J.: *See*—
Penneck, Richard J.; O'Brien, James M.; Duckworth, Stephen J.; and Smith, Nicholas J. G., 4,985,313, Cl. 428-627.000.

Ducrocq, Claire A.: *See*—
Wimmer, Eric P.; Lecolier, Serge L.; Ducrocq, Claire A.; Servy, Claudine G.; and Lenfant, Maryse T., 4,985,357, Cl. 435-128.000.

Duhamel, Pierre: *See*—
Hmida, Hedi; and Duhamel, Pierre, 4,985,862, Cl. 364-786.000.

Duke, Horace W. Apparatus and methods for removing folds in the confronting material at the open edges of flexible packaging material prior to sealing. 4,984,416, Cl. 53-480.000.

Dulong, Carole; Leclerc, Jean-Yves; and Scaglia, Patrick, to Evans & Sutherland Computer Corp. Multiprocessor task scheduling system. 4,985,831, Cl. 364-200.000.

Dumas, Donald J.: *See*—
Bellis, Harold E.; Dumas, Donald J.; Sonnichsen, George C.; and Subramanyam, Vinayakam, 4,985,180, Cl. 260-404.000.

Duncan, Frank L.; Hughes, Donald W. K.; and Ward, Bobby G., to AMP Incorporated. High density electrical connector. 4,984,998, Cl. 439-352.000.

Dunn, Daniel L., Jr., to Uarco Incorporated. Dual mailer construction. 4,984,733, Cl. 229-72.000.

Dunn, John M.: *See*—
Singer, Norman; Wilcox, Reed; Podolski, Joseph S.; Chang, Hsien-Hsin; Pookote, Suseelan; Dunn, John M.; and Hatchwell, Leora, 4,985,270, Cl. 426-515.000.

Duphar International Research B.V.: *See*—
den Hartog, Jacobus A. J.; van Stuivenberg, Herman H.; and van Wijngaarden, Ineke, 4,985,423, Cl. 514-219.000.
Hamminga, Derk; Haeck, Hans H.; Van Wijngaarden, Ineke; and Wouters, Wouter, 4,985,420, Cl. 514-211.000.
van Wijngaarden, Ineke; Hamminga, Derk; Haeck, Hans H.; and Wouters, Wouter, 4,985,424, Cl. 514-220.000.

Du Pont de Nemours, E. I., and Company: *See*—
Allen, Steven R., 4,985,193, Cl. 264-184.000.
Anderson, Albert G.; Hertler, Walter R.; Wheland, Robert C.; and Chen, Yuan Yu G., 4,985,332, Cl. 430-176.000.
Batt, Douglas G., 4,985,435, Cl. 514-277.000.
Batt, Douglas G., 4,985,442, Cl. 514-277.000.
Bellis, Harold E.; Dumas, Donald J.; Sonnichsen, George C.; and Subramanyam, Vinayakam, 4,985,180, Cl. 260-404.000.
Ebersole, Richard C.; and Foss, Robert P., 4,985,128, Cl. 204-182.800.

El-Sayed, Lyla M.; Marcus, Sanford M.; and Trout, Torence J., 4,985,329, Cl. 430-115.000.
Figuly, Garret D., 4,985,536, Cl. 528-272.000.
Freund, Kenneth S., 4,984,772, Cl. 270-30.000.
Griffin, Charles D., 4,985,320, Cl. 430-30.000.
Hannon, John L., Jr., 4,984,765, Cl. 251-5.000.
Hannon, John L., Jr., 4,985,191, Cl. 264-135.000.
Hartzler, Jon D., 4,985,046, Cl. 8-654.000.
Henry, Cyrus P.; and Spinelli, Harry J., 4,985,160, Cl. 252-51.50R.
Huang, Hua-Feng, 4,985,300, Cl. 428-332.000.
Huybrechts, Jozef T.; and Zimmt, Werner, 4,985,591, Cl. 562-102.000.
Kamins, Kathryn A.; and Statz, Robert J., 4,985,497, Cl. 525-84.000.
Kirksey, Kirby, 4,985,228, Cl. 423-584.000.
McCall, James E., 4,984,440, Cl. 68-200.000.
Mikulin, Joseph F., 4,984,688, Cl. 206-455.000.
Rucker, Klaus G.; Simmons, Walter J.; and Stilwell, Larry T., 4,985,610, Cl. 219-70.000.
Squire, Edward N., 4,985,308, Cl. 428-422.000.
Tam, Wilson, 4,985,178, Cl. 252-587.000.
Walter, Timothy H.; and Pontiff, Thomas M., 4,984,376, Cl. 36-30.00R.
Wang, Chia-Lin J.; and Wuonola, Mark A., 4,985,429, Cl. 514-253.000.
Wang, Teh-Chuan, 4,985,304, Cl. 428-373.000.

Dutchess Bakers' Machinery Co. Inc.: *See*—
Beatty, David E., 4,984,978, Cl. 425-185.000.

Dutton, Virgil R., to Core Medical Corporation. Hand wash towel dispensing system. 4,984,530, Cl. 118-43.000.

Dutzmann, Stefan: *See*—
Kramer, Wolfgang; Weissmuller, Joachim; Berg, Dieter; Brandes, Wilhelm; and Dutzmann, Stefan, 4,985,421, Cl. 514-212.000.

Dziurla, Hans-Jurgen; Reinking, Klaus; Wehnert, Wolfgang; and Tresper, Erhard, to Bayer Aktiengesellschaft. Elastomer-modified carbon-containing polyarylene sulfide blends. 4,985,175, Cl. 252-506.000.

E.R.A. Display Co. Ltd.: *See*—
Eiley, Stan; and Tremblay, Marc, 4,984,721, Cl. 223-96.000.

Ealick, Steve E.: *See*—
Secrist, John A., III; Montgomery, John A.; Ealick, Steve E.; Erion, Mark D.; and Guida, Wayne C., 4,985,433, Cl. 514-258.000.
Secrist, John A., III; Montgomery, John A.; Ealick, Steve E.; Erion, Mark D.; and Guida, Wayne C., 4,985,434, Cl. 514-248.000.

Eastman Kodak Company: *See*—
Chatterjee, Dilip K., 4,985,085, Cl. 148-101.000.
Keep, Gerald T., 4,985,293, Cl. 428-209.000.

Eastport International: *See*—
Fineberg, Douglas H., 4,984,969, Cl. 417-58.000.

Eaton Corporation: *See*—
Glennon, Thomas F.; and Torrence, Robert J., 4,984,735, Cl. 236-92.00B.
McNinch, Joseph H., Jr., 4,984,852, Cl. 303-15.000.

Eaton, Leo W.: *See*—
Miller, Norman P.; and Eaton, Leo W., 4,984,621, Cl. 165-10.000.

Ebara Corporation: *See*—
Osada, Noriyuki; Hisabe, Yasushi; Ohtani, Toshihiro; and Kanamori, Toshiya, 4,984,881, Cl. 350-616.000.

Ebersole, Richard C.; and Foss, Robert P., to Du Pont de Nemours, E. I., and Company. Process for preparation of electrophoresis. 4,985,128, Cl. 204-182.800.

Eberspacher, J.: *See*—
Reiser, Peter; Steiert, Edwin; and Schaffert, Wolfgang, 4,984,736, Cl. 237-2.00A.

Echigo, Katsuhiro: *See*—
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Tsuruoka, Ichiro; Takenouchi, Hiroaki; and Echigo, Katsuhiro, 4,985,733, Cl. 355-282.000.

Echte, Adolf: *See*—
Bronstert, Klaus; Hoenl, Hans; Echte, Adolf; and Klaerner, Peter, 4,985,503, Cl. 525-193.000.

Eckel, Hans-Gerd: *See*—
Kurr, Klaus; Eckel, Hans-Gerd; Seifert, Heinz; Idigkeit, Werner; and Barth, Armin, 4,984,777, Cl. 267-140.100.

Eckel, John D.: *See*—
Daghe, Joe L.; Eckel, John D.; and Heidbrier, Warren G., 4,984,767, Cl. 251-297.000.

Eckel, Thomas; Wittmann, Dieter; Leitz, Edgar; Schoeps, Jochen; Ott, Karl-Heinz; and Peters, Horst, to Bayer Aktiengesellschaft. Thermoplastic moulding compounds with low temperature toughness obtained from aromatic polyester carbonates and special graft polymers. 4,985,493, Cl. 525-67.000.

Eckel, Thomas: *See*—
Wittmann, Dieter; Eckel, Thomas; Ott, Karl-Heinz; Damrath, Volker; and Westeppe, Uwe, 4,985,492, Cl. 525-63.000.

Eckert, Wolfgang, to Degussa. Process for filling traveling silo containers. 4,984,610, Cl. 141-5.000.

Eckhardt, Volker: *See*—
Pakull, Ralf; Freitag, Dieter; Eckhardt, Volker; Idel, Karsten-Josef; and Westeppe, Uwe, 4,985,532, Cl. 528-190.000.

Edwardson, Svante R., to Dentatus International AB. Dental instrument. 4,984,985, Cl. 433-123.000.

Efthimion, Philip C.: *See*—
Helfritch, Dennis J.; and Efthimion, Philip C., 4,985,219, Cl. 423-235.000.

Egawa, Takeshi; Nakai, Masaaki; Nakanishi, Yasuo; Ishimura, Toshihiko; Nishimura, Shinichi; Tsuji, Sadafusa; and Ishibashi, Kenji, to Minolta Camera Kabushiki Kaisha. Photographic camera. 4,985,723, Cl. 354-400.000.

Egerton, Terence A.; Lawson, Edmund J.; and Frost, Peter W. Stabilized metallic oxides. 4,985,379, Cl. 501-104.000.

Eggleston, Robert E. Transformer bushing cap. 4,985,599, Cl. 174-138.00F.

Egitto, Frank D.; and Mlynko, Walter E., to International Business Machines Corporation. Enhanced plasma etching. 4,985,112, Cl. 156-643.000.

Eguchi, Kazuhiro; Ochiai, Eiichi; Ito, Shinichiro; Yoneda, Takehiko; Taki, Hiromitsu; Noguchi, Toshiharu; Kiyosue, Kuniaki; Yoshida, Akiro; Sagawa, Morikazu; and Makimoto, Mitsuo, to Matsushita Electric Industrial Co., Ltd. Dielectric stepped impedance resonator. 4,985,690, Cl. 333-222.000.

Eickmann, Karl. Arrangements on coned rings which are applicable in high pressure pumps and related devices. 4,984,970, Cl. 417-271.000.

Eidenschink, Rudolf; Krause, Joachim; Wachtler, Andreas; Hittich, Reinhard; Scheuble, Bernhard; Weber, Georg; and Kurmeier, Hans-Adolf, to Merck Patent Gesellschaft mit beschrankter Haftung. Cyclohexane derivatives. 4,985,583, Cl. 558-431.000.

Eiley, Stan; and Tremblay, Marc, to E.R.A. Display Co. Ltd. Garment hanger. 4,984,721, Cl. 223-96.000.

Eisai Co., Ltd.: *See*—
Kakimoto, Fumio; Asakawa, Naoki; Ishibashi, Yasuo; and Miyake, Yasuo, 4,985,245, Cl. 424-94.300.

Ejike, Ofomata E.: *See*—
Camire, Alexis L.; Ejike, Ofomata E.; Krumhar, Kim C.; and Taranto, Michael V., 4,985,262, Cl. 426-302.000.

Eklund, Robert H.: *See*—
Spratt, David B.; Virkus, Robert L.; Eklund, Robert H.; and Zorinsky, Eldon J., 4,985,744, Cl. 357-43.000.

Ekornes, Jostein, to J. E. Ekornes A/S. Arrangement in an adjustable chair. 4,984,846, Cl. 297-317.000.

Electricite de France (Service National): *See*—
Gemma, Antoine, 4,984,598, Cl. 134-166.00R.

Elexis Corporation: *See*—
Bianco, Frank J.; Owen, Charles W.; and Talamas, Elie, Jr., 4,985,632, Cl. 250-372.000.

Ellens, Daniel S.: *See*—
Dehne, Clarence A.; and Ellens, Daniel S., 4,984,523, Cl. 105-155.000.

Eller, Audrey L. Fine jewelry enclosing wearer identification and medical information therein. 4,984,683, Cl. 206-38.000.

Elliott, Michael: *See*—
Casida, John E.; and Elliott, Michael, 4,985,411, Cl. 514-63.000.

Ellis, Charles V. Wine dispenser. 4,984,711, Cl. 222-82.000.

Ellis, Frank: *See*—
Waterhouse, Ian; Naylor, Alan; Wallis, Christopher J.; and Ellis, Frank, 4,985,427, Cl. 514-242.000.

Ellis, Herbert S., to Aquatic Amusement Associated, Ltd. Swimming lane marker system. 4,985,007, Cl. 441-133.000.

Ellis, John R.: *See*—
Beamenderfer, Robert E.; Buchheister, Raymond R., Jr.; Ellis, John R.; Miller, Charles A.; Moist, Stanford C., Jr.; and Zelko, William E., 4,984,992, Cl. 439-108.000.

Ellis, Larry R. Free standing baby gate. 4,984,619, Cl. 160-351.000.

Ellison, Garry L.; and Sears, Kim W., to Root-Lowell. Container and pump assembly. 4,984,742, Cl. 239-373.000.

Elmes, Alfred R.; Hammond, Kevin; and Sherrington, David C., to Unilever Patent Holdings B.V. Porous material and its preparation. 4,985,468, Cl. 521-63.000.

El-Sayed, Lyla M.; Marcus, Sanford M.; and Trout, Torence J., to Du Pont de Nemours, E. I., and Company. Bipolar liquid electrostatic developer. 4,985,329, Cl. 430-115.000.

El Tawil, Mamdouh M.; and Albrethsen, Adrian E., to ASARCO Incorporated. Reduction roasting of metal ores. 4,985,216, Cl. 423-29.000.

Elterman, Charles W.: *See*—
Cohn, Arnold K.; and Elterman, Charles W., 4,984,760, Cl. 248-126.000.

Elving, Hans B. O., to Trion Forskning-Och Utvecklings Aktiebolag. Method for the diagnosis of whooping-cough and a test kit for carrying the method into effect. 4,985,353, Cl. 435-7.000.

Emalfarb, Bradley S.: *See*—
Emalfarb, Seymour; and Emalfarb, Bradley S., 4,984,689, Cl. 206-499.000.

Emalfarb, Seymour; and Emalfarb, Bradley S. Packaging system for landscaping bed dividers. 4,984,689, Cl. 206-499.000.

Emhart Inc.: *See*—
Gobel, Bernd; and Ziemann, Andreas, 4,984,730, Cl. 228-1.100.

Emmons, Lawrence D.; Mackley, James S.; Stokes, David H.; Stefenel, Rudolph S.; Brisko, William E., Jr.; and Cooper-Hart, Michael A., to Mitsubishi Electronics America, Inc. Conversational video phone. 4,985,911, Cl. 379-53.000.

Empresa de Portos do Brasil S.A. -Portobras: *See*—
de Oliveira Filho, Florencio; and Pires, Valtair P. L., 4,984,935, Cl. 405-224.000.

Emura, Junichi: *See*—
Kakizaki, Shinobu; Yamaoka, Fumiyuki; Kikushima, Shigeru; and Emura, Junichi, 4,984,819, Cl. 280-707.000.

Endlweber, Hans, to Messer Griesheim GmbH. Preserving animal hides. 4,985,039, Cl. 8-94.150.
Endo, Nobuyuki, to Pioneer Electronic Corporation. Light reflector. 4,985,815, Cl. 362-294.000.
Endo, Shunzo: *See*—
Iizuka, Yo; Kashiwadate, Ken; Hosokawa, Toshio; Endo, Shunzo; Katto, Takayuki; Mizuno, Toshiya; and Katase, Kenichi, 4,985,512, Cl. 525-537.000.
Endo, Syuzo: *See*—
Iizuka, Shigeo; Nakamura, Hiroyuki; Kishi, Takao; and Endo, Syuzo, 4,984,918, Cl. 401-4.000.
Endo, Yoshiaki: *See*—
Sawada, Michinori; Watanabe, Norio; and Endo, Yoshiaki, 4,984,345, Cl. 29-263.000.
Endres, Robert; Weber, Wilhelm; and Preuss, Krystyna, to Bayer Aktiengesellschaft. RTV 1K compositions which are stable in storage in the absence of moisture and form elastomers which can be painted. 4,985,476, Cl. 523-210.000.
Enichem Synthesis, S.p.A.: *See*—
Neri, Carlo; Nodari, Nereo; and Sandre, Giovanni, 4,985,481, Cl. 524-120.000.
Enkegaard, Torben, to F. L. Smidth & Co. A/S. Method of cofiring hazardous waste in industrial rotary kilns. 4,984,983, Cl. 432-14.000.
ENM Company: *See*—
Mitchell, Paul, 4,985,875, Cl. 368-5.000.
Enomoto, Tadayoshi: *See*—
Yamashina, Masakazu; Yamada, Hachiro; and Enomoto, Tadayoshi, 4,985,861, Cl. 364-746.200.
Enomoto, Takamichi: *See*—
Takiguchi, Yasuyuki; Kanemoto, Akihiko; Yokoi, Kenya; Iimura, Haruo; Enomoto, Takamichi; and Kamoi, Sumio, 4,984,873, Cl. 350-337.000.
Enomoto, Yuji, to Agency of Industrial Science & Technology; and Ministry of International Trade and Industry. Indenter for fractoemission measurement. 4,984,453, Cl. 73-81.000.
Enyo, Hiroji: *See*—
Iwanaga, Shin-ichiro; Matsunaga, Tatsuaki; Nishiwaki, Ituo; and Enyo, Hiroji, 4,985,513, Cl. 526-80.000.
Erickson, Kenneth R.: *See*—
Keppel, William; and Erickson, Kenneth R., 4,984,578, Cl. 128-732.000.
Erion, Mark D.: *See*—
Secrist, John A., III; Montgomery, John A.; Ealick, Steve E.; Erion, Mark D.; and Guida, Wayne C., 4,985,433, Cl. 514-258.000.
Secrist, John A., III; Montgomery, John A.; Ealick, Steve E.; Erion, Mark D.; and Guida, Wayne C., 4,985,434, Cl. 514-248.000.
Erler, Klaus: *See*—
Klose, Sigmar; Erler, Klaus; Uhl, Wolfgang; and Bajer, Manfred, 4,985,204, Cl. 422-56.000.
Erlich, Moshe. Loose leaf holder. 4,984,924, Cl. 402-4.000.
Ernhoffer, Robert E.: *See*—
Farng, Liehpao O.; Horodysky, Andrew G.; Ernhoffer, Robert E.; and Keller, John A., Jr., 4,985,157, Cl. 252-49.600.
Erpenbach, Heinz; Lork, Winfried; Seidel, Andreas; and Prinz, Peter, to Hoechst Aktiengesellschaft. Process for removing metallic corrosion products from a contaminated catalyst solution produced on carbonylation of methanol and/or methyl acetate and/or dimethyl ether. 4,985,383, Cl. 502-24.000.
Eschner, Axel: *See*—
Bruckner, Raimund; Eschner, Axel; Langenfeld, Wilhelm; Oberbach, Manfred; Rothfuss, Hans; and Stusser, Dieter, 4,984,769, Cl. 266-44.000.
Esformes, Jack L.; and Ubowski, Lawrence W., to Carrier Corporation. Embossed vortex generator enhanced plate fin. 4,984,626, Cl. 165-151.000.
Eskla B.V.: *See*—
Klaren, Dick G., 4,984,624, Cl. 165-104.160.
Esrock, Bernard S. Dental tool and nozzle therefor. 4,984,984, Cl. 433-88.000.
Esselte Meto International Produktions GmbH: *See*—
Becker, Werner, 4,985,110, Cl. 156-540.000.
Etablissement Texcontor: *See*—
Conti, Franco, 4,985,410, Cl. 514-54.000.
ETAT Francais represente par le Ministre Delegue des Postes et Telecommunications (Centre National d'Etudes des Telecommunications): *See*—
Hmida, Hedi; and Duhamel, Pierre, 4,985,862, Cl. 364-786.000.
Evangelista, Donato D.: *See*—
Alexander, Thomas R.; Evangelista, Donato D.; and Leo, Michael F., 4,984,778, Cl. 271-117.000.
Evans, Albert D. Free stand with programmable music program playing means. 4,985,699, Cl. 340-825.240.
Evans, Ian D.: *See*—
Bee, Rodney D.; Evans, Ian D.; and Izzard, Martin J., 4,985,250, Cl. 424-401.000.
Evans, Michael W.: *See*—
Campbell, W. Carroll; Evans, Michael W.; Browning, Edward A., Jr.; and Stone, Robert J., 4,985,804, Cl. 361-384.000.
Evans, Robert: *See*—
Bowman, David J.; Cosgrove, Raymond F.; Male, Terence P.; and Evans, Robert, 4,985,206, Cl. 422-99.000.
Evans, Robert D.: *See*—
Buzby, John H.; and Evans, Robert D., 4,985,120, Cl. 162-199.000.
Evans & Sutherland Computer Corp.: *See*—
Dulong, Carole; Leclerc, Jean-Yves; and Scaglia, Patrick, 4,985,831, Cl. 364-200.000.
Exac Corporation: *See*—
Dahlin, Erik B., 4,984,472, Cl. 73-861.380.
Explosive Research and Development Corporation: *See*—
McCulloch, Charles R., 4,985,093, Cl. 149-19.400.
Exxon Chemical Patents, Inc.: *See*—
Yezrielev, Albert I.; Romanelli, Michael G.; and Wellman, William E., 4,985,517, Cl. 526-208.000.
Exxon Research and Engineering Company: *See*—
Cody, Ian A.; and Hamner, Glen P., 4,985,135, Cl. 208-114.000.
Eyl, Kevin A.; Kurkjian, Andrew L.; Lineman, David J.; Pierce, Edward A.; and Steiner, Joseph M., Jr., to Schlumberger Technology Corporation. Method and apparatus for determining compressional first arrival times from waveform threshold crossings provided by apparatus disposed in a sonic well tool. 4,985,873, Cl. 367-27.000.
Ezuz, Shabtai: *See*—
Landa, Benzion; Ezuz, Shabtai; Karin, Jakob; and Fenster, Paul, 4,985,732, Cl. 355-256.000.
F.I.M.A.C. Fabbrica Italiana Macchine Aria Compressa S.p.A.: *See*—
Callerio, Antonio; and Callerio, Vincenzo, 4,984,964, Cl. 415-55.400.
F. L. Smidth & Co. A/S: *See*—
Enkegaard, Torben, 4,984,983, Cl. 432-14.000.
F.M.Locotos Co., Inc.: *See*—
Scott, Ralph F., Jr.; and Locotos, Frank M., 4,984,938, Cl. 405-261.000.
Fabbrica D'Armi P. Beretta S.p.A.: *See*—
Beretta, Pier G., 4,984,504, Cl. 89-163.000.
Fabricius, Nils. Resilient floor. 4,984,404, Cl. 52-480.000.
Faccia, Tiziano. Mixer particularly for fibrous products. 4,984,900, Cl. 366-305.000.
FAG Kugelfischer Georg Schafer (KGaA): *See*—
Kronenberger, Alban; and Bayer, Oswald, 4,984,908, Cl. 384-478.000.
Falcimaigne, Jean, to Institut Francais du Petrole. Device for the remote assembly of two members. 4,984,527, Cl. 114-264.000.
Falck, Francis. Piloting interface for 8 mm video cameras and VTR's and accessories, by computer. 4,985,783, Cl. 358-335.000.
Faller, Rudolph. Multi-ply film susceptor for microwave cooking. 4,985,606, Cl. 219-10.55E.
Fallon, Patrick J. Acoustical/optical bin picking system. 4,985,846, Cl. 364-513.000.
Fanuc Ltd.: *See*—
Iwagaya, Takashi, 4,985,841, Cl. 364-474.330.
Shinozaki, Satoru, 4,985,840, Cl. 364-474.290.
Faraci, Anthony B., to Dallas Semiconductor Corporation. Apparatus for connecting electronic modules containing integrated circuits and backup batteries. 4,985,870, Cl. 365-228.000.
Farmitalia Carlo Erba S.R.L.: *See*—
Caruso, Michele; Suarato, Antonino; Angelucci, Francesco; and Arcamone, Federico, 4,985,548, Cl. 536-6.400.
Cozzi, Paolo; Carganico, Germano; Severino, Dino; Lovisolo, Pierpaolo; and Chiari, Augusto, 4,985,440, Cl. 514-397.000.
Farng, Liehpao O.; Horodysky, Andrew G.; Ernhoffer, Robert E.; and Keller, John A., Jr., to Mobil Oil Corporation. Mixed alkoxylated alcohol-hydroquinone/resorcinol borates-antioxidants. 4,985,157, Cl. 252-49.600.
Farnsworth, Dennis G., to Newington Corporation. Wrench. 4,984,503, Cl. 81-13.000.
Farris, Ben J. Push-pull paint scraper tool. 4,984,324, Cl. 15-236.050.
Fattori, Joseph E., to Mennen Company, The. Sealing cap for elongated roll-on package. 4,984,921, Cl. 401-208.000.
Fauchard, Pierre, to Centre National d'Etudes des Telecommunications. Device for the separation and alignment of objects and a sorting installation for using same. 4,984,678, Cl. 198-443.000.
Faulds, Daryl H.; and Vishoot, Mimi, to ML Technology Ventures, L.P. Composition and method for protecting against diseases caused by microorganisms. 4,985,243, Cl. 424-85.800.
Fearnot, Neal E.; Hawkins, Melvin K.; and Sisken, Richard B., to MED Institute, Inc.; and Cook Incorporated. Catheter having durable and flexible segments. 4,985,022, Cl. 604-282.000.
Fedeli, Gianfranco; Diamantini, Giuseppe; Maontovani, Marisa; and Prino, Giuseppe, to Crinos Industria Farmacobiologica S.p.A. Process for obtaining chemically defined and reproducible polydeoxyribonucleotides. 4,985,552, Cl. 536-27.000.
Fedor, Robert A.: *See*—
Irvin, Scot A.; Fedor, Robert A.; and Merritt, Carleton G., 4,985,269, Cl. 426-560.000.
Feinauer, Roland: *See*—
Schueler, Ralf; Muegge, Joachim; Droescher, Michael; Bartz, Wilfried; and Feinauer, Roland, 4,985,494, Cl. 525-67.000.
Feldman, Nathan W.; and Shar, Malvin L. Lighting protection apparatus for RF equipment and the like. 4,985,800, Cl. 361-113.000.
Feller, Roger K.; Warner, Samuel R.; and Capriotti, Janice D., to Ford Motor Company. Engine testing system. 4,984,454, Cl. 73-117.300.
Fenster, Paul: *See*—
Landa, Benzion; Ezuz, Shabtai; Karin, Jakob; and Fenster, Paul, 4,985,732, Cl. 355-256.000.
Ferag AG.: *See*—
Reist, Walter, 4,984,411, Cl. 53-118.000.
Fernando, Gerard M. X., to U.S. Philips Corporation. Method and apparatus for picture motion measurement whereby two pictures are correlated as a function of selective displacement. 4,985,765, Cl. 358-105.000.

Feustel, Michael: *See—*
Wirtz, Herbert; Feustel, Michael; and Balzer, Juliane, 4,985,048, Cl. 44-394.000.

Fibresep Ltd.: *See—*
Monteith, Joseph G., 4,985,148, Cl. 210-519.000.

Fichter, Otmar: *See—*
Riedel, Wolfgang; Wissler, Richard; Fichter, Otmar; Gregorius, Klaus; Mattauch, Gerhard; and Schorner, Heinz, 4,985,805, Cl. 361-386.000.

Fiedler, Lawrence D.: *See—*
Baney, Ronald H.; Bilgrien, Carl J.; Fiedler, Lawrence D.; and Lee, Chi-long, 4,985,565, Cl. 548-110.000.

Fieldcrest Cannon, Inc.: *See—*
Moore, W. Gerald; and Webster, Nancy W., 4,984,606, Cl. 139-25.000.

Fierthaler, Frederick. Thermally insulated beverage mug. 4,984,707, Cl. 220-412.000.

Figuly, Garret D., to Du Pont de Nemours, E. I., and Company. Copolyetherester elastomer with cycloaliphatic hard segments. 4,985,536, Cl. 528-272.000.

Fillit, Howard; Damle, Shridhar P.; Zabriskie, John; and Gregory, John D., to Rockefeller University, The. Kit for the determination and diagnosis of non-goodpasture glomerulonephritis. 4,985,542, Cl. 530-395.000.

Findakly, Talal K.: *See—*
Suchoski, Paul G., Jr.; Findakly, Talal K.; and Leonberger, Frederick J., 4,984,861, Cl. 350-96.110.

Findlay, Hugh T.; Froman, Kenneth H.; and Martone, James F., to Internal Business Machine Corporation. Multicolored fabric printing ribbon including nonbleeding, nonmigrating flushed pigment. 4,984,912, Cl. 400-240.200.

Fineberg, Douglas H., to Eastport International. Plunger lift tool. 4,984,969, Cl. 417-58.000.

Finn, Everett N., to Brown & Williamson Tobacco Corporation. Hopper apparatus. 4,984,412, Cl. 53-387.000.

Finney, Clifton D. Golf clubhead with a corner-back system of weight distribution. 4,984,799, Cl. 273-169.000.

Finnigan Corporation: *See—*
Hurst, James, 4,985,625, Cl. 250-288.000.

Finnigan, Wilfred J. Electronic fire protection system. 4,984,637, Cl. 169-61.000.

First City, Texas- N. A.: *See—*
Oncken, John E., 4,985,833, Cl. 364-408.000.

First Inertia Switch Limited: *See—*
Thomas, Alan D.; and Kalami, Hoshmand, 4,984,464, Cl. 73-517.00R.

Firstenberg, Mark A.: *See—*
Webb, David A., Jr.; Fite, David B.; Hetherington, Ricky C.; McKeen, Francis X.; Firstenberg, Mark A.; Murray, John E.; Manley, Dwight P.; Salett, Ronald M.; and Fossum, Tryggve, 4,985,825, Cl. 364-200.000.

Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. 3-aryl-pyrrolidine-2,4-diones. 4,985,063, Cl. 71-88.000.

Fischler, Mark S.: *See—*
Atac, Robert; Fischler, Mark S.; and Husby, Donald E., 4,985,830, Cl. 364-200.000.

Fisher Controls International, Inc.: *See—*
Storer, William J. A., 4,984,471, Cl. 73-861.240.

Fishman, Lawrence. Percussion transducer. 4,984,498, Cl. 84-730.000.

Fite, David B.: *See—*
Webb, David A., Jr.; Fite, David B.; Hetherington, Ricky C.; McKeen, Francis X.; Firstenberg, Mark A.; Murray, John E.; Manley, Dwight P.; Salett, Ronald M.; and Fossum, Tryggve, 4,985,825, Cl. 364-200.000.

Fitz, Herbert: *See—*
Herbrechtsmeier, Peter; Wieners, Gerhard; Kuhls, Jurgen; Tschacher, Manfred; and Fitz, Herbert, 4,984,870, Cl. 350-96.340.

Flakt, Inc.: *See—*
Josefsson, Leif E. B., 4,984,595, Cl. 134-38.000.

Flamig, Peter, to Protechna Herbst GmbH & Co. K.G. Method and apparatus for optically monitoring a knitted article. 4,984,896, Cl. 356-429.000.

Flanigen, Edith M.: *See—*
Lok, Brent M. T.; Marcus, Bonita K.; Vail, Lawrence D.; Flanigen, Edith M.; Patton, Robert L.; and Wilson, Stephen T., 4,985,151, Cl. 210-689.000.

Flannery, Ann M.: *See—*
Pease, Kevin J.; Copella, Robert A.; and Flannery, Ann M., 4,985,614, Cl. 235-440.000.

Flauraud, Daniel J. N., to Avdel Systems Limited. Fastener. 4,984,947, Cl. 411-43.000.

Flexmedics Corporation: *See—*
Stice, James D., 4,984,581, Cl. 128-772.000.

Flint, Glenda S.: *See—*
Flint, Matthew L.; and Flint, Glenda S., 4,984,369, Cl. 30-374.000.

Flint, Matthew L.; and Flint, Glenda S. Device for removing grout. 4,984,369, Cl. 30-374.000.

Floren, Carl E.: *See—*
Sands, Robert E.; and Floren, Carl E., 4,984,362, Cl. 29-890.128.

FMC Corporation: *See—*
Theodoridis, George, 4,985,065, Cl. 71-92.000.

Foa, Marco: *See—*
Coassolo, Alfredo; Chapoy, L. Lawrence; Foa, Marco; and Sabarino, Giampiero, 4,985,533, Cl. 528-193.000.

Focke & Co. (GmbH & Co.): *See—*
Focke, Heinz, 4,984,409, Cl. 53-53.000.

Focke, Heinz, to Focke & Co. (GmbH & Co.). Process and apparatus for the testing of carton packs. 4,984,409, Cl. 53-53.000.

Foley, Clark P.; and Taylor, Donald L., to Tektronix, Inc. Statistical waveform profiler employing counter/timer. 4,985,844, Cl. 364-487.000.

Fontaine, James A.: *See—*
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,985,848, Cl. 364-518.000.

Foot-Joy, Inc.: *See—*
Curley, John J., Jr.; Yang, Jui-Chiung; and Yeh, Tzu-Hung, 4,984,320, Cl. 12-146.0BR.

Foote & Davies, Inc.: *See—*
Lindsay, Robert J.; Bell, Rodney E.; and McNickle, William, 4,984,948, Cl. 412-1.000.

Ford Microelectronics, Inc.: *See—*
Kwok, Siang P., 4,985,369, Cl. 437-41.000.

Ford Motor Company: *See—*
Connor, Frederick D., 4,984,930, Cl. 403-290.000.
Feller, Roger K.; Warner, Samuel R.; and Capriotti, Janice D., 4,984,454, Cl. 73-117.300.

Foreman, Michael J.; and Greene, Harold R., to ComCo Systems. Pneumatic tube transmission system with slow-down blower. 4,984,939, Cl. 406-84.000.

Fornasier, Roberto; Tornatore, Massimo; and Chapoy, Larry L., to Himont Italia s.r.l. Liquid-crystalline, thermotropic polymer from di-s-triazine and diamine. 4,985,539, Cl. 528-423.000.

Forrest, Richard M. Archery bow sight. 4,984,373, Cl. 33-265.000.

Forsheda AB: *See—*
Bengtsson, Christer, 4,984,831, Cl. 285-379.000.

Forster, Josef: *See—*
Rauner, Hans; Grauvogl, Erwin; Gerl, Gerhard; and Forster, Josef, 4,985,859, Cl. 364-565.000.

Forsythe, Donald D.: *See—*
Aronowitz, Sheldon; Forsythe, Donald D.; Walker, George P.; and Gadepally, Bhaskar V. S., 4,985,717, Cl. 357-23.500.

Fortenberry, John D. Tipping apparatus and method for tilting carrier conveyor. 4,984,674, Cl. 198-365.000.

Foseco International Limited: *See—*
Barker, Sidney A.; Baggett, Neil; Stevenson, John; George, Raymond D.; De Courcy, David R.; Hammond, Timothy; and Bradley, Martin, 4,985,489, Cl. 524-594.000.

Fosroc International Limited: *See—*
Annett, Martin F.; France, Barry; and Stanford, Tania, 4,984,933, Cl. 405-150.000.

Foss, Robert P.: *See—*
Ebersole, Richard C.; and Foss, Robert P., 4,985,128, Cl. 204-182.800.

Fossum, Tryggve: *See—*
Webb, David A., Jr.; Fite, David B.; Hetherington, Ricky C.; McKeen, Francis X.; Firstenberg, Mark A.; Murray, John E.; Manley, Dwight P.; Salett, Ronald M.; and Fossum, Tryggve, 4,985,825, Cl. 364-200.000.

Foster, Raymond K. Seal between reciprocating conveyor floor members. 4,984,679, Cl. 198-750.000.

Foster, Richard G., to Motorola, Inc. High impedance piezoelectric transducer. 4,985,926, Cl. 381-77.000.

Fouillet, Jean-Marie: *See—*
Cohen, Herve ; and Fouillet, Jean-Marie, 4,985,901, Cl. 375-10.000.

Fourgaut, Lue: *See—*
LeDoux, Patrick; and Fourgaut, Lue, 4,985,196, Cl. 264-516.000.

Fowler, Eugene C., to Tip Computers International. Information bearing assembly. 4,984,825, Cl. 283-98.000.

Fox, Robert J.; and Hoodlebrink, Merlin P., to Clarmatic Industries, Inc. Filtering system. 4,985,146, Cl. 210-413.000.

Foxton, Michael W.; Ayres, Barry E.; and Cooper, Anthony W. J., to Glaxo Group Limited. Dipeptide compounds, processes for their preparation and compositions containing them. 4,985,407, Cl. 514-19.000.

Frackiewicz, Henryk: *See—*
Toczyski, Zygmunt; Kruczynski, Stanislaw W.; Frackiewicz, Henryk; Lozinski, Janusz; Chlopek, Zdzislaw; Danilczyk, Wiktor; Ranachowski, Jerzy; Janula, Janusz; and Wolski, Lech, 4,984,550, Cl. 123-478.000.

France, Barry: *See—*
Annett, Martin F.; France, Barry; and Stanford, Tania, 4,984,933, Cl. 405-150.000.

Franceschina, Louis E. Method of reducing tubular products. 4,984,444, Cl. 72-205.000.

Francois, Pierre; and Prodel, Michel H. M. F., to S.I.C.A.M.E. Societe Industrielle de Construction d'Appareils et de Material Electrique. Branching electrical connector and spacer therefor. 4,985,003, Cl. 439-781.000.

Franetzki, Manfred: *See—*
Obermann, Peter; and Franetzki, Manfred, 4,985,015, Cl. 604-67.000.

Frank, Helge: *See—*
Albarda, Scato; Frank, Helge; and Marcoll, Joachim, 4,985,165, Cl. 252-62.540.

Frankenreiter, Michael, to Hewlett-Packard Company. Oscillometric non-invasive method for measuring blood pressure and apparatus for

automated oscillometric blood pressure measuring. 4,984,577, Cl. 128-681.000.
Frankish, Anthony J.; Stewart, Ian B.; and Stockdale, John A., to Sprint International Communications Corporation. Data packet switching. 4,985,889, Cl. 370-94.100.
Fraser, Andrew A. Jet nozzle for propelling an apparatus along a conduit and apparatus provided with such a jet nozzle. 4,985,763, Cl. 358-100.000.
Frass, Werner: *See*—
Rode, Klaus; Mohr, Dieter; Frass, Werner; and Gersdorf, Joachim, 4,985,341, Cl. 430-287.000.
Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V.: *See*—
Hofler, Heinrich; and Bergmann, Eckhard, 4,984,898, Cl. 356-358.000.
Riedel, Wolfgang; Wissler, Richard; Fichter, Otmar; Gregorius, Klaus; Mattauch, Gerhard; and Schorner, Heinz, 4,985,805, Cl. 361-386.000.
Fredrickson, Robert N. Chain saw log gauge for obtaining firewood logs of uniform length. 4,984,371, Cl. 33-263.000.
Freeman, David H.; Angeles, Rosalie M.; and Keller, Suzanne, to University of Maryland, The. Method for packing chromatographic beds. 4,985,143, Cl. 210-198.200.
Freitag, Dieter: *See*—
Pakull, Ralf; Freitag, Dieter; Eckhardt, Volker; Idel, Karsten-Josef; and Westeppe, Uwe, 4,985,532, Cl. 528-190.000.
Freund, Kenneth S., to Du Pont de Nemours, E. I., and Company. High speed crosslapper. 4,984,772, Cl. 270-30.000.
Friesen, Peter. Building panel. 4,984,406, Cl. 52-594.000.
Frito-Lay, Inc.: *See*—
Camire, Alexis L.; Ejike, Ofomata E.; Krumhar, Kim C.; and Taranto, Michael V., 4,985,262, Cl. 426-302.000.
Fritsche, Rainer; Nohl, Klaus; Pollmann, Klaus; and Schmidt, Elmar, to Boehringer Mannheim GmbH. Test carrier analysis system. 4,985,205, Cl. 422-56.000.
Froman, Kenneth H.: *See*—
Findlay, Hugh T.; Froman, Kenneth H.; and Martone, James F., 4,984,912, Cl. 400-240.200.
Frosien, Juergen: *See*—
Brunner, Matthias; Frosien, Juergen; Schmitt, Reinhold; and Lischke, Burkhard, 4,985,681, Cl. 324-501.000.
Frost, Peter W.: *See*—
Egerton, Terence A.; Lawson, Edmund J.; and Frost, Peter W., 4,985,379, Cl. 501-104.000.
Fuel Tech, Inc.: *See*—
DeVita, Vincent A., 4,985,218, Cl. 423-235.000.
Fugier, Roger: *See*—
de Goys de Mezeyrac, Charles; Fugier, Roger; Giquel, Bernard; and Tetard, Serge, 4,985,482, Cl. 524-215.000.
Fuji Electric Co., Ltd.: *See*—
Kuroda, Masami; Sugata, Yoshinobu; and Furusho, Noboru, 4,985,325, Cl. 430-59.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Morikawa, Koji, 4,984,540, Cl. 123-73.00C.
Fuji Oil Company, Ltd.: *See*—
Sawamura, Norio; Matsuo, Takaharu; and Hashimoto, Yukio, 4,985,358, Cl. 435-134.000.
Fuji Photo Film Co., Ltd.: *See*—
Fujimoto, Hiroshi; Yagihara, Morio; and Ishikawa, Takatoshi, 4,985,347, Cl. 430-393.000.
Higaski, Nobuaki; Ishida, Masamitsu; and Nakajima, Nobuyoshi, 4,985,630, Cl. 250-327.200.
Hirano, Mitsunori; Hirano, Masato; Yagihara, Morio; and Okada, Hisashi, 4,985,348, Cl. 430-434.000.
Horikawa, Kazuo, 4,985,629, Cl. 250-327.200.
Ichijima, Seiji; and Mihayashi, Keiji, 4,985,336, Cl. 430-223.000.
Ikeda, Hideo; and Ishimaru, Shingo, 4,985,350, Cl. 430-567.000.
Ikeda, Kenji; Iwakura, Ken; and Takashima, Masanobu, 4,985,391, Cl. 503-208.000.
Kataoka, Hideaki; and Sashihara, Kenji, 4,985,334, Cl. 430-207.000.
Kawada, Yukihiro, 4,985,777, Cl. 358-227.000.
Kitatani, Katsuji; Makino, Naonori; Hoshi, Satoshi; Sato, Hideo; and Ohno, Shigeru, 4,985,324, Cl. 430-56.000.
Koizumi, Shigeo; and Hayakawa, Yoshihide, 4,985,339, Cl. 430-270.000.
Murayama, Jin; and Kondo, Ryuji, 4,985,775, Cl. 358-213.130.
Omote, Hiroki; and Kataoka, Hideaki, 4,985,335, Cl. 430-209.000.
Onmori, Shozo; Takahashi, Daisuke; and Oishi, Kengo, 4,985,798, Cl. 360-132.000.
Saeki, Keiso; Shinozaki, Fumiaki; and Fujita, Yutaka, 4,985,331, Cl. 430-138.000.
Saito, Yuuji; and Ogoda, Makoto, 4,984,780, Cl. 271-292.000.
Sakai, Minoru; Katoh, Kazunobu; Yamaguchi, Jiro; Okada, Hisashi; Yasuda, Tomokazu; and Satake, Masaki, 4,985,338, Cl. 430-264.000.
Shibata, Norio; and Tsunehiko, Sato, 4,985,284, Cl. 427-428.000.
Takahashi, Shinsuke; Shibata, Norio; and Sato, Tsunehiko, 4,984,533, Cl. 118-419.000.
Yokoya, Hiroaki; Tachikawa, Hiromichi; and Sato, Hideo, 4,985,323, Cl. 430-49.000.
Fuji Photo Optical Co., Ltd.: *See*—
Miyano, Hitoshi, 4,984,878, Cl. 350-469.000.
Fuji Tekko Co., Ltd.: *See*—
Kato, Tadahiko, 4,984,663, Cl. 192-0.02R.
Fuji Xerox Co., Ltd.: *See*—
Iwasaki, Yasuo, 4,984,779, Cl. 271-227.000.
Fuji Yakuhin Kogyo Kabushiki Kaisha: *See*—
Achiwa, Kazuo; and Takeda, Hideo, 4,985,567, Cl. 548-412.000.
Fujibayashi, Kazuo; Hayakawa, Shingo; and Kiyohara, Shuchi, to Canon Kabushiki Kaisha. Photometric device for camera. 4,985,726, Cl. 354-432.000.
Fujibayashi, Ryoichi: *See*—
Nakamura, Yoshiaki; Fujibayashi, Ryoichi; and Murakami, Yuji, 4,985,234, Cl. 424-45.000.
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, to Mitsubishi Rayon Co., Ltd. Optical fiber ribbon end-structure. 4,984,859, Cl. 350-96.240.
Fujii, Aturo: *See*—
Ariga, Masahiro; Takise, Saburou; and Fujii, Aturo, 4,984,554, Cl. 123-516.000.
Fujii, Katsutoshi: *See*—
Yoshioka, Hirosuke; Obata, Tokio; Fujii, Katsutoshi; Tsutsumiuchi, Kiyoshi; and Yoshiya, Haruo, 4,985,426, Cl. 514-241.000.
Fujii, Motoharu: *See*—
Ayata, Naoki; Sato, Yasushi; Saito, Seiji; Koumura, Noboru; and Fujii, Motoharu, 4,985,778, Cl. 358-296.000.
Fujii, Ryuichi: *See*—
Ogitani, Osamu; and Fujii, Ryuichi, 4,985,474, Cl. 522-107.000.
Fujii, Sadao; Takase, Junji; and Kawai, Hideki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Birefringent transparent film and process for producing the same. 4,985,531, Cl. 528-171.000.
Fujii, Tetsuya: *See*—
Kumagai, Yuugo; Tan, Ryouji; Ikeda, Takashi; Fujii, Tetsuya; Okada, Chiaki; Higashida, Osamu; Sugitani, Hatuo; and Fukasawa, Masato, 4,985,328, Cl. 430-110.000.
Fujii, Yasuhiro: *See*—
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, 4,985,449, Cl. 514-349.000.
Fujikawa, Tetsuzo: *See*—
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,984,417, Cl. 56-11.300.
Fujimaki, Yoko, to Shiratori Co. Ltd. Water sliders with turning toboggans. 4,984,783, Cl. 272-565.00R.
Fujimori, Junichi, to Yamaha Corporation. Musical tone signal generating apparatus. 4,984,495, Cl. 84-603.000.
Fujimori Kogyo Co., Ltd.: *See*—
Ichikawa, Rinjiro; and Hashimoto, Kenji, 4,985,285, Cl. 428-1.000.
Fujimoto, Hiroshi; Yagihara, Morio; and Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photographic materials comprising the use of specific bleaching agents and hydroxylamines. 4,985,347, Cl. 430-393.000.
Fujimoto, Izumi: *See*—
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Yano, Toshihiko; Fujimoto, Izumi; and Takada, Yoji, 4,985,460, Cl. 514-594.000.
Fujimoto, Kotaro; Tanaka, Yoshie; Kawahara, Hironobu; and Sato, Yoshiaki, to Hitachi, Ltd. Sample treating method and apparatus. 4,985,113, Cl. 156-643.000.
Fujimoto, Yasuyuki: *See*—
Kushi, Kenji; Inukai, Ken-ichi; Iseki, Takayuki; and Fujimoto, Yasuyuki, 4,985,343, Cl. 430-285.000.
Fujinaga, Yoshikazu: *See*—
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,984,859, Cl. 350-96.240.
Fujino, Masaru: *See*—
Mori, Yoshiaki; Fujino, Masaru; Takagi, Hiroshi; and Sakabe, Yukio, 4,985,381, Cl. 501-136.000.
Fujioka, Keiji; Sato, Shigeji; Tamura, Nobuhiko; and Takada, Yoshihiro, to Sumitomo Pharmaceuticals Company, Limited. Sustained release composition for pharmaceutical substances comprising a silicone elastomer carrier. 4,985,253, Cl. 424-488.000.
Fujioka, Takashi; and Yamanouchi, Masahide, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor package. 4,985,753, Cl. 357-80.000.
Fujisawa, Hiromichi; Hatakeyama, Atsushi; Nakano, Yasuaki; Higashino, Junichi; and Hananoi, Toshihiro, to Hitachi, Ltd. Document storage and retrieval system. 4,985,863, Cl. 364-900.000.
Fujisawa, Kazuhiro: *See*—
Mano, Hiroyuki; Takashi, Terumi; Fujisawa, Kazuhiro; Hasegawa, Kaoru; Matsumoto, Shinzo; and Fujita, Mitsuhisa, 4,985,698, Cl. 340-784.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, 4,985,444, Cl. 514-300.000.
Takaya, Takao; Tozuka, Zenzaburo; Yasuda, Nobuyoshi; and Kawabata, Kohji, 4,985,555, Cl. 540-229.000.
Fujita Corporation: *See*—
Ohshima, Yoshio; Watanabe, Tsunekazu; Watanabe, Keizaburo; Nonoyama, Noboru; Kitazume, Masayoshi; and Tomita, Yukihiro, 4,985,149, Cl. 210-603.000.
Fujita, Hiroki: *See*—
Okada, Osamu; Takami, Susumu; Kotani, Tamotu; Mori, Satoshi; Fujita, Hiroki; Fukumura, Naoko; and Ippommatsu, Masamichi, 4,985,074, Cl. 75-444.000.
Fujita, Kazuo. Folding stage unit. 4,984,398, Cl. 52-7.000.
Fujita, Mitsuhisa: *See*—
Mano, Hiroyuki; Takashi, Terumi; Fujisawa, Kazuhiro; Hasegawa, Kaoru; Matsumoto, Shinzo; and Fujita, Mitsuhisa, 4,985,698, Cl. 340-784.000.

Fujita, Motohiro: *See*—
Shinoda, Akihisa; Fujita, Motohiro; Tsusaka, Haruo; Yonezawa, Makoto; and Nakano, hiroyuki, 4,984,539, Cl. 123-41.420.
Fujita, Takashi: *See*—
Matsuura, Mitsuyuki; and Fujita, Takashi, 4,985,515, Cl. 526-125.000.
Fujita, Toshio: *See*—
Sugawara, Hitoshi; Goto, Minoru; Sakamaki, Yoshitaka; and Fujita, Toshio, 4,985,208, Cl. 422-135.000.
Fujita, Yutaka: *See*—
Saeki, Keiso; Shinozaki, Fumiaki; and Fujita, Yutaka, 4,985,331, Cl. 430-138.000.
Fujitsu Limited: *See*—
Hoshino, Kazuhiro, 4,985,750, Cl. 357-71.000.
Nakano, Tomio; and Nomura, Hidenori, 4,985,868, Cl. 365-222.000.
Ogawara, Akihiro, 4,985,904, Cl. 375-38.000.
Ohba, Hiroki; Koshi, Makoto; and Kumasaka, Norihiro, 4,985,730, Cl. 355-208.000.
Sakakura, Shigeki; and Komuro, Akihiro, 4,985,731, Cl. 355-210.000.
Seki, Junji, 4,985,920, Cl. 380-23.000.
Tanaka, Shigeyoshi; and Yanagi, Shigenori, 4,985,882, Cl. 369-44.320.
Fujitsu VLSI Limited: *See*—
Nakano, Tomio; and Nomura, Hidenori, 4,985,868, Cl. 365-222.000.
Fujiwara, Katsuki: *See*—
Ohmure, Yukio; Kashiwagi, Hiroshi; Fujiwara, Katsuki; Tsuchiya, Tatsumi; and Aoyama, Hirokazu, 4,985,168, Cl. 252-67.000.
Fujiwara, Koji: *See*—
Tohzuka, Takashi; Kataoka, Yoshiaki; Ishikawa, Sueyoshi; and Fujiwara, Koji, 4,985,161, Cl. 252-54.000.
Fujiwara, Masatsugu: *See*—
Sakashita, Kiichiro; Tanikawa, Hirohide; Yoshida, Satoshi; Nakahara, Toshiaki; Matsushige, Naoki; Fujiwara, Masatsugu; and Mitsuhashi, Yasuo, 4,985,327, Cl. 430-106.600.
Fujiwara, Ryuhei; Fukazawa, Yasuo; and Asano, Takashi, to NEC Corporation. ISDN system having subscriber line multiplexer with means for establishing different data links through D-channels on subscriber line and high rate transmission line. 4,985,891, Cl. 370-110.100.
Fujiwara, Takuji; Yoshimura, Hiroshi; Ishii, Kozo; and Takemoto, Kazuo, to Mazda Motor Corporation. Hydraulic control system for automatic transmission. 4,984,484, Cl. 74-866.000.
Fukagawa, Yoshihiro: *See*—
Kano, Kiyoshi; Kaku, Nobuyuki; Shigemura, Tatsuya; Tanaka, Yoshiyuki; Fukagawa, Yoshihiro; and Uesugi, Masaki, 4,985,788, Cl. 360-85.000.
Fukasawa, Masato: *See*—
Kumagai, Yuugo; Tan, Ryouji; Ikeda, Takashi; Fujii, Tetsuya; Okada, Chiaki; Higashida, Osamu; Sugitani, Hatuo; and Fukasawa, Masato, 4,985,328, Cl. 430-110.000.
Fukazawa, Yasuo: *See*—
Fujiwara, Ryuhei; Fukazawa, Yasuo; and Asano, Takashi, 4,985,891, Cl. 370-110.100.
Fukuda, Yujiro; and Utsumi, Shigeo, to Diafoil Company, Limited. Shrinkable polyester film. 4,985,538, Cl. 528-305.000.
Fukuhara, Takahito: *See*—
Kuroda, Tomoyuki; and Fukuhara, Takahito, 4,985,174, Cl. 252-408.100.
Fukui, Tsutomu; Koike, Hideto; and Ayukai, Kemmi, to Oki Electric Industry Co., Ltd. Medium detecting system with automatic compensation for sensor variations. 4,985,636, Cl. 250-559.000.
Fukui, Yoshiharu; and Kuroda, Kazuhisa, to Sumitomo Chemical Company, Ltd. Inorganic filler containing polyolefin composition. 4,985,480, Cl. 524-108.000.
Fukumoto, Hiroshi: *See*—
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Fukumura, Naoko: *See*—
Okada, Osamu; Takami, Susumu; Kotani, Tamotu; Mori, Satoshi; Fujita, Hiroki; Fukumura, Naoko; and Ippommatsu, Masamichi, 4,985,074, Cl. 75-444.000.
Fukunaga, Kanji: *See*—
Watanabe, Hidetaka; and Fukunaga, Kanji, 4,985,884, Cl. 369-263.000.
Fukunaga, Masayuki, to NEC Corporation. Voice storage/retrieval system with memory address generator successively initialized with start-point addresses. 4,985,914, Cl. 379-88.000.
Fukushima, Hiroshi: *See*—
Aosai, Fumito; Fukushima, Hiroshi; and Hado, Hisako, 4,985,472, Cl. 522-64.000.
Fukushima, Masato: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,573, Cl. 549-402.000.
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,574, Cl. 549-402.000.
Fukushima, Masayuki: *See*—
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Fukuta, Kenji: *See*—
Nagatsuka, Yoshihiro; and Fukuta, Kenji, 4,984,340, Cl. 28-104.000.
Fukuyama, Masahiro: *See*—
Yoshida, Nobuyuki; Tanaka, Hisao; and Fukuyama, Masahiro, 4,985,507, Cl. 525-387.000.
Fukuyasu, Harumi: *See*—
Tsuruoka, Tsutomu; Nakabayashi, Satoru; Fukuyasu, Harumi; Ishii, Yuuko; Tsuruoka, Takashi; Yamamoto, Haruo; Inouye, Shigeharu; and Kondo, Shinichi, 4,985,445, Cl. 514-315.000.
Fukuyo, Hiroshi: *See*—
Ohno, Yotaro; Matsuura, Masahiro; Sato, Kenkichi; and Fukuyo, Hiroshi, 4,985,075, Cl. 75-460.000.
Fulford, Colin: *See*—
Samejima, Kazuo; Kawakita, Hiroaki; Togoshi, Yoshikazu; Matsuda, Yoshiaki; Sakatsuji, Takao; and Fulford, Colin, 4,984,420, Cl. 56-203.000.
Funaki, Yuji; and Fukushima, Masayuki, to Sumitomo Chemical Company, Limited. Production of tetrahydrophthalimide compound. 4,985,570, Cl. 548-513.000.
Funakoshi, Takeshi: *See*—
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,836, Cl. 364-426.020.
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,838, Cl. 364-426.020.
Fuqua Industries, Inc. (Snapper Division): *See*—
Phillips, Wayne, 4,984,479, Cl. 74-480.00R.
Furukawa, Hidehiko: *See*—
Takiguchi, Yo; Tani, Tokio; Kawashima, Ichiro; Ohsumi, Jun; Furukawa, Hidehiko; and Ohmine, Toshinori, 4,985,361, Cl. 435-218.000.
Furukawa, Noriyuki: *See*—
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,984,859, Cl. 350-96.240.
Furukawa, Yoshimi: *See*—
Sano, Shoichi; Furukawa, Yoshimi; Takei, Akihiko; Nishi, Yutaka; and Ohno, Yasuaki, 4,984,646, Cl. 180-79.100.
Furusho, Noboru: *See*—
Kuroda, Masami; Sugata, Yoshinobu; and Furusho, Noboru, 4,985,325, Cl. 430-59.000.
Furusho, Takao: *See*—
Sugita, Norifumi; Niimura, Koichi; Oguchi, Yoshiharu; Hirose, Kunitaka; Matsunaga, Kenichi; Oohara, Minoru; Muto, Shigeaki; Kakuchi, Junji; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 4,985,543, Cl. 530-396.000.
Furuya, Hiromi: *See*—
Hayakawa, Kunio; Furuya, Hiromi; Shimada, Hisanori; Nakata, Masahiro; Kodera, Kaoru; Oohara, Kouji; and Akagi, Nobuo, 4,985,345, Cl. 430-335.000.
Furuya, Koichi; Nakashima, Hiroshi; Iida, Yasunobu; Takeuchi, Nobuyuki; and Nakamura, Masato, to Central Glass Company, Limited. Heat reflecting glass plate with multilayer coating. 4,985,312, Cl. 428-627.000.
Furuya, Nobuaki; Ono, Takuhiro; Horiuchi, Naoya; Yamanaka, Keiichro; and Miyata, Takeo, to Matsushita Electric Industrial Co., Ltd. Narrow-band laser apparatus. 4,985,898, Cl. 372-106.000.
Fuso Pharmaceutical Industries, Ltd.: *See*—
Kuroda, Nihee, 4,984,415, Cl. 53-478.000.
Fuwa, Yoshio: *See*—
Kaede, Hiroshi; Koike, Tadahiro; Kato, Shinji; Maeda, Yorishige; Fuwa, Yoshio; Sugimoto, Shigetoshi; Aoyagi, Hikaru; and Shibata, Shinzi, 4,985,092, Cl. 148-326.000.
G B Instruments, Inc.: *See*—
Michel, Thomas J., 4,984,676, Cl. 198-365.000.
G-C Dental Industrial Corp.: *See*—
Hirasawa, Tadashi; and Harashima, Ikuro, 4,985,198, Cl. 560-130.000.
Gade, Edward R.: *See*—
Sather, Keith O.; Gade, Edward R.; Tandeski, David A.; and Olson, Lawrence E., 4,984,360, Cl. 29-890.053.
Gadepally, Bhaskar V. S.: *See*—
Aronowitz, Sheldon; Forsythe, Donald D.; Walker, George P.; and Gadepally, Bhaskar V. S., 4,985,717, Cl. 357-23.500.
GAF Chemicals Corporation: *See*—
Lewis, David F.; Schenfele, Robert D.; and Winkler, Thomas, 4,985,290, Cl. 428-76.000.
Login, Robert B.; Merianos, John J.; Dandreaux, Gary; and Shih, Jenn S., 4,985,521, Cl. 526-264.000.
Shih, Jenn S.; and Smith, Terry E., 4,985,487, Cl. 524-548.000.
Gall, Winrich, to Intergraph Corporation. Improved method and apparatus for generating halftone images. 4,985,779, Cl. 358-298.000.
Gamand, Patrice, to U.S. Philips Corp. High-frequency circuit having a loaded field-effect transistor. 4,985,642, Cl. 307-304.000.
Gammon, Nathan A.: *See*—
Shepler, Peter R.; Gammon, Nathan A.; Hopkins, William M.; Koerner, James E.; and Schmaltx, Charles K., 4,984,616, Cl. 152-209.00A.
Gangarosa, Raymond E.; and Chui, K. Ming, to Picker International, Inc. Horizontal field iron core magnetic resonance scanner. 4,985,678, Cl. 324-318.000.
Garnier, Steven F.; and Doran, John, to Melco Industries, Inc. Portable electronically controlled laser engraving machine. 4,985,780, Cl. 358-299.000.
Garreau, Francois: *See*—
Prigent, Michel; Blanchard, Gilbert; Garreau, Francois; and Courty, Philippe, 4,985,387, Cl. 502-304.000.

Garret, Claude; Guyon, Claude; Plau, Bernard; and Taurand, Gerard, to Rhone-Poulenc Sante. Phenothiazine derivatives, their preparation and pharmaceutical compositions containing them. 4,985,419, Cl. 514-211.000.

Garth, Peter: *See—*
Simpson, Stuart M.; Garth, Peter; and Richards, Jonathan, 4,984,316, Cl. 5-508.000.

Gasomatic - Airbag International Ltd.: *See—*
Kim, Sang N.; Kroiss, Alfred; and Methfessel, Heinz, 4,984,821, Cl. 280-728.000.

Gawel, Henry A.: *See—*
Ashjian, Henry; and Gawel, Henry A., 4,985,156, Cl. 252-49.600.

Gaylord, Thomas K.; Brennan, Kevin F.; and Glytsis, Elias N., to Georgia Tech Research Corporation. Solid state quantum mechanical electron and hole wave devices. 4,985,737, Cl. 357-4.000.

GBE International plc: *See—*
Bird, Derek G.; and Westlake, Anthony S., 4,984,374, Cl. 34-50.000.
Neville, Richard E. G., 4,984,587, Cl. 131-305.000.

Gemeinhardt, Hermann; Hoff, Elmar; and Schurmann, Erich, to Akzo N.V. Tube sheet for apparatus for transferring heat and/or mass, use thereof and process for its production. 4,984,630, Cl. 165-173.000.

Gemma, Antoine, to Electricite de France (Service National). System for working on the primary pipework and water box of a nuclear power station steam generator. 4,984,598, Cl. 134-166.00R.

Gemmell, Peter A.: *See—*
Beck, Nicholas C.; Gemmell, Peter A.; and Hann, Richard A., 4,985,398, Cl. 503-227.000.

General Electric Company: *See—*
Cerutti, David B., 4,985,050, Cl. 51-293.000.
Chang, Keh-Minn; and Vasatis, Ioannis P., 4,985,201, Cl. 420-109.000.
Cline, Harvey E.; Hartley, Richard I.; Ludke, Siegwalt; and Noujaim, Sharbel E., 4,985,834, Cl. 364-413.220.
Iacovangelo, Charles D., 4,985,076, Cl. 106-1.260.
Johnson, Bruce F.; and Mondello, Frank J., 4,985,589, Cl. 560-130.000.
Ortiz, Angel L., Jr., 4,984,885, Cl. 356-153.000.
Piel, Joseph E., Jr.; and Smith, Lowell S., 4,984,465, Cl. 73-602.000.
Shenai, Krishna; Baliga, Bantval J.; Piacente, Patricia A.; and Korman, Charles S., 4,985,740, Cl. 357-23.400.
Waslo, Jennifer; Kuwata, Masayoshi; and Washam, Roy M., 4,984,429, Cl. 60-752.000.

General Motors Corporation: *See—*
Bajpai, Atul; Marczewski, Richard W.; Marek, Melissa M.; Shrivastava, Anil B.; Amble, Charles S.; Joyce, Robert H.; Kishore, Nanda; and Ollanik, Steven J., 4,985,857, Cl. 364-551.010.
Beckmeyer, Richard F., 4,984,487, Cl. 76-107.100.
Smith, Jack E., 4,984,776, Cl. 267-276.000.

General Shoelace Co.: *See—*
Gribbins, William R., 4,984,410, Cl. 53-116.000.

George Enterprise Ltd.: *See—*
Joyal, George L., 4,984,746, Cl. 239-722.000.

George, Eric R., to Shell Oil Company. Coating process. 4,985,278, Cl. 427-195.000.

George, Raymond D.: *See—*
Barker, Sidney A.; Baggett, Neil; Stevenson, John; George, Raymond D.; De Courcy, David R.; Hammond, Timothy; and Bradley, Martin, 4,985,489, Cl. 524-594.000.

Georgia Tech Research Corporation: *See—*
Gaylord, Thomas K.; Brennan, Kevin F.; and Glytsis, Elias N., 4,985,737, Cl. 357-4.000.

Gerber Garment Technology, Inc.: *See—*
Gerber, Heinz J., 4,984,492, Cl. 83-697.000.

Gerber, Heinz J., to Gerber Garment Technology, Inc. Cutting blade and method for cutting sheet material. 4,984,492, Cl. 83-697.000.

Gerl, Gerhard: *See—*
Rauner, Hans; Grauvogl, Erwin; Gerl, Gerhard; and Forster, Josef, 4,985,859, Cl. 364-565.000.

Gerry Baby Products Company: *See—*
Knoedler, Roy E.; Au, William G.; and Parker, Robert M., 4,984,845, Cl. 297-250.000.

Gersdorf, Joachim: *See—*
Rode, Klaus; Mohr, Dieter; Frass, Werner; and Gersdorf, Joachim, 4,985,341, Cl. 430-287.000.

Gierke, Daniel. Circuit testing apparatus. 4,985,893, Cl. 371-16.200.

Gillan, Leland E.; and Wagner, Robert J. Power post driver and hammer. 4,984,640, Cl. 173-123.000.

Gillette Company, The: *See—*
Leonard, Elizabeth C.; and Shurtleff, Jill M., 4,984,365, Cl. 30-34.050.

Gilligan, Lawrence H.; and Ladd, Charles B., to Sperry Marine Inc. Apparatus and method for inhibiting blooming in television cameras. 4,985,773, Cl. 358-211.000.

Gilson, Jean-Pierre, to W. R. Grace & Co-Conn. Cracking catalysts having aromatic selectivity. 4,985,384, Cl. 502-61.000.

Giobbio, Vincenzo; and Ambrosini, Leonardo, to Chementecno S.r.l.; and Irca Industrie Ricerche Chimiche d'Albano S.p.A. Process for preparing amikacin. 4,985,549, Cl. 536-13.800.

Giovanna, Marco D., to Sirti S.p.A. Connector for optical fiber conductors. 4,984,867, Cl. 350-96.210.

Giquel, Bernard: *See—*
de Goys de Mezeyrac, Charles; Fugier, Roger; Giquel, Bernard; and Tetard, Serge, 4,985,482, Cl. 524-215.000.

Gist-Brocades N.V.: *See—*
Verweij, Jan; De Koning, Jan J.; and Witkamp, Hendrik A., 4,985,554, Cl. 540-215.000.

Glaeser, Winfried: *See—*
Schuett, Dieter; and Glaeser, Winfried, 4,985,649, Cl. 307-465.000.
Schuett, Dieter; and Glaeser, Winfried, 4,985,650, Cl. 307-465.000.

Glass, Henry G.; and Glass, Herbert G. Disk launcher. 4,984,556, Cl. 124-5.000.

Glass, Herbert G.: *See—*
Glass, Henry G.; and Glass, Herbert G., 4,984,556, Cl. 124-5.000.

Glaverbel: *See—*
Mertens, Guy; Reydams, Jean-Jacques; and Wasterlain, Michel, 4,985,099, Cl. 156-94.000.

Glavish, Hilton F.: *See—*
Stengl, Gerhard; and Glavish, Hilton F., 4,985,634, Cl. 250-492.200.

Glaxo Group Limited: *See—*
Foxton, Michael W.; Ayres, Barry E.; and Cooper, Anthony W. J., 4,985,407, Cl. 514-19.000.
North, Peter C.; Oxford, Alexander W.; Coates, Ian H.; and Beswick, Paul J., 4,985,422, Cl. 514-215.000.
Richards, David A., 4,985,418, Cl. 514-179.000.
Tyers, Michael B., 4,985,437, Cl. 514-304.000.
Waterhouse, Ian; Naylor, Alan; Wallis, Christopher J.; and Ellis, Frank, 4,985,427, Cl. 514-242.000.

Glennon, Thomas F.; and Torrence, Robert J., to Eaton Corporation. Sensing refrigerant temperature in a thermostatic expansion valve. 4,984,735, Cl. 236-92.00B.

Glick, J. Leslie, to Bionix Corporation. Methods for diagnosing, monitoring and controlling the onset and progression of certain dementias and impeding memory loss or improving impairment of memory. 4,985,256, Cl. 424-697.000.

Glockner, Volker: *See—*
Scholz, Ralph-Peter; and Glockner, Volker, 4,985,280, Cl. 427-244.000.

Glytsis, Elias N.: *See—*
Gaylord, Thomas K.; Brennan, Kevin F.; and Glytsis, Elias N., 4,985,737, Cl. 357-4.000.

GMF Robotics Corporation: *See—*
Akeel, Hadi A.; and Malarz, Antoni J., 4,984,745, Cl. 239-587.000.

Gobel, Bernd; and Ziemann, Andreas, to Emhart Inc. Quality control for wire bonding. 4,984,730, Cl. 228-1.100.

Gobets, Roy A.: *See—*
Tengler, John N.; and Gobets, Roy A., 4,985,000, Cl. 439-497.000.

Goble, E. Marlowe. Drill guide. 4,985,032, Cl. 606-96.000.

Goldberg, Eugene P.; Li, Fu-Mian; and Luo, Ching-Wang, to University of Florida. UV Absorbing vinyl monomers. 4,985,559, Cl. 544-34.000.

Goldberg, Seth; and Logan, Jonothan L. Noninvasive fetal oxygen monitor using NMR. 4,984,574, Cl. 128-653.00A.

Golini, Paolo: *See—*
Bianchi, Daniele; Cesti, Pietro; and Golini, Paolo, 4,985,366, Cl. 435-280.000.

Gomoll, Guenter: *See—*
Hauslaib, Wolfgang; and Gomoll, Guenter, 4,984,917, Cl. 400-656.000.

Gooch, Beverley R., to Ampex Corporation. Method and apparatus using a stationary magnetic body for effecting signal transfers between a moving magnetic core and a magnetic storage medium. 4,985,795, Cl. 360-115.000.

Goode, Richard L.: *See—*
Burgert, Paul H.; Goode, Richard L.; and Burke, Terry L., 4,984,579, Cl. 128-747.000.

Goodyear Tire & Rubber Company, The: *See—*
Shepler, Peter R.; Gammon, Nathan A.; Hopkins, William M.; Koerner, James E.; and Schmaltx, Charles K., 4,984,616, Cl. 152-209.00A.

Gorman, Michael E.: *See—*
Bose, Sudhangshu; and Gorman, Michael E., 4,985,316, Cl. 429-44.000.

Gormley, Thomas P.; and Crofoot, James F., to Carrier Corporation. Rolling rotor motor balancing means. 4,984,480, Cl. 74-573.00R.

Gorodnichev, Jury N.: *See—*
Kozachevsky, Gennady G.; Boikov, Vladimir P.; Guskov, Valery V.; Molodan, Oleg I.; Sizova, Svetlana I.; and Gorodnichev, Jury N., 4,984,976, Cl. 425-35.000.

Goto, Hideki, to Kabushiki Kaisha Kobe Seiko Sho. Wheel crane. 4,984,695, Cl. 212-231.000.

Goto, Minoru: *See—*
Sugawara, Hitoshi; Goto, Minoru; Sakamaki, Yoshitaka; and Fujita, Toshio, 4,985,208, Cl. 422-135.000.

Goto, Takashi: *See—*
Mizushina, Fumio; Goto, Takashi; and Maruki, Toshimitsu, 4,984,988, Cl. 434-380.000.

Gotz, Eckart; Lerch, Hans-Reter; Dorsam, Thomas; Schweigert, Gerhard; Wittmann, Werner; and Korner, Michael, to Robert Bosch GmbH. Modular electrical control distribution system. 4,985,845, Cl. 364-492.000.

Gouin, Marcel: *See—*
Delvaux, Pierre; Desrosiers, Luc; and Gouin, Marcel, 4,985,164, Cl. 252-62.000.

Grab, George P.: *See—*
Bryant, William A.; and Grab, George P., 4,984,940, Cl. 407-119.000.

Grabbe, Dimitry G.: *See—*
Korsunsky, Iosif; Bateman, Steven P.; and Grabbe, Dimitry G., 4,984,997, Cl. 439-331.000.

Graf, Peter E.; Agazzi, Steven J.; and Vanderzanden, Eugene J., to Chevron Research Company. Open-graded asphalt emulsion mixes. 4,985,079, Cl. 106-502.000.

Graffunder, Bruce. Adjustable pickup truck box carrier. 4,984,814, Cl. 280-35.000.

Gramer, Kurt: *See—*
Bauer, Theodor; Zweigart, Gerhard; and Gramer, Kurt, 4,984,841, Cl. 296-118.000.

Grassel, Michael C.: *See—*
White, Edward C.; Blake, Douglas T.; and Grassel, Michael C., 4,984,941, Cl. 408-104.000.

Grauvogl, Erwin: *See—*
Rauner, Hans; Grauvogl, Erwin; Gerl, Gerhard; and Forster, Josef, 4,985,859, Cl. 364-565.000.

Grebenyuk, Alexander: *See—*
Reed, Herbert M.; Sager, Scott J.; Grebenyuk, Alexander; and Torchia, Stephen F., 4,984,352, Cl. 29-568.000.

Greco, Saverio G.: *See—*
Audeh, Costandi A.; and Greco, Saverio G., 4,985,220, Cl. 423-240.000.

Green Cone Inc: *See—*
Warrington, Jack E., 4,984,561, Cl. 126-417.000.

Green, Richard D. Twin compartment squeeze bottle. 4,984,715, Cl. 222-129.000.

Greene, Harold R.: *See—*
Foreman, Michael J.; and Greene, Harold R., 4,984,939, Cl. 406-84.000.

Gregorius, Klaus: *See—*
Riedel, Wolfgang; Wissler, Richard; Fichter, Otmar; Gregorius, Klaus; Mattauch, Gerhard; and Schorner, Heinz, 4,985,805, Cl. 361-386.000.

Gregory, John D.: *See—*
Fillit, Howard; Damle, Shridhar P.; Zabriskie, John; and Gregory, John D., 4,985,542, Cl. 530-395.000.

Greiner, Jacques: *See—*
Charpiot, Brigitte; Greiner, Jacques; Le Blanc, Maurice; Manfredi, Alexandre; Riess, Jean; and Zarif, Leila, 4,985,550, Cl. 536-18.400.

Gribbins, William R., to General Shoelace Co. Apparatus of winding and packaging shoelaces into pairs. 4,984,410, Cl. 53-116.000.

Griffin, Charles D., to Du Pont de Nemours, E. I., and Company. Processor chemistry control strip reader and replenishment system. 4,985,320, Cl. 430-30.000.

Griffis, Steven C. Supplied air respirator system. 4,985,057, Cl. 55-269.000.

Grimes, Gary J.: *See—*
Blyler, Lee L., Jr.; and Grimes, Gary J., 4,984,864, Cl. 350-96.160.

Grimminger, Albert; Lauser, Wolfgang; Muller, Franz J.; Pfaff, Gerhard; and Schlipf, Edgar, to Werner & Pfleiderer, GmbH. Screw-type extruder having a starting valve and throttle. 4,984,977, Cl. 425-145.000.

Grochowski, Edward; and Gupta, Rajesh, to Intel Corporation. Apparatus for generating computer clock pulses. 4,985,640, Cl. 307-269.000.

Grondalski, Robert S., to Digital Equipment Corporation. SIMD array processing system with routing networks having plurality of switching stages to transfer messages among processors. 4,985,832, Cl. 364-200.000.

Grootscholten, Paulus A. M.; and Van Der Schee, Gerrit L. Fat-containing compositions having a low phosphatide content. 4,985,272, Cl. 426-609.000.

Grosch, Lothar; Zeidler, Falk; Katz, Egon; and Bossenmaier, Alban, to Daimler-Benz AG. Passenger restraint system. 4,984,651, Cl. 180-268.000.

Grote & Hartmann GmbH & Co. KG: *See—*
Zinn, Bernd, 4,985,004, Cl. 439-851.000.

Groya, Robert J.; and Hofman, Richard W., to Magenta Corporation. Side dispensing closure. 4,984,720, Cl. 222-531.000.

Grumman Aerospace Corporation: *See—*
Kolbert, Melvin, 4,985,922, Cl. 380-59.000.

Grzina, Anthony, to Warman International Limited. Method of making liner. 4,984,966, Cl. 29-888.061.

GTE Government Systems Corporation: *See—*
Sweeney, Harold E., 4,984,903, Cl. 374-123.000.

GTE Products Corporation: *See—*
Westlund, Arnold, Jr.; and Buschmann, Jeffrey P., 4,985,656, Cl. 313-318.000.

Guelfi, Giorgio: *See—*
Villa, Ezio; Biazzi, Giuseppe; and Guelfi, Giorgio, 4,984,843, Cl. 296-213.000.

Guethlein, Werner; and Merdes, Hartmut, to Boehringer Mannheim GmbH. 1-naphtholphthalein monophosphates and diagnostic reagents containing them. 4,985,414, Cl. 514-100.000.

Gueyne, Jean; Seguin, Marie-Christine; and Henrotte, Jean-Georges. Therapeutic product based on organic silicon derivatives. 4,985,405, Cl. 514-008.000.

Guida, Wayne C.: *See—*
Secrist, John A., III; Montgomery, John A.; Ealick, Steve E.; Erion, Mark D.; and Guida, Wayne C., 4,985,433, Cl. 514-258.000.
Secrist, John A., III; Montgomery, John A.; Ealick, Steve E.; Erion, Mark D.; and Guida, Wayne C., 4,985,434, Cl. 514-248.000.

Gulya, Thomas G.; Schultz, Gary V.; and Arnold, Ronald A., to Appleton Mills. Ceramic foam member for extracting water from a paper web in a papermaking machine. 4,985,121, Cl. 162-352.000.

Gunesin, Binnur Z.; and Pindris, Paul A., to Mobil Oil Corporation. Process of dispersion polymerization of butadiene in propane or butane. 4,985,505, Cl. 525-250.000.

Guntzburger, Philippe: *See—*
Haghiri, Mohammad R.; Guntzburger, Philippe; and Le Queau, Marcel, 4,985,767, Cl. 358-133.000.

Guoli, Giacomo: *See—*
Strada, Antonio; Bertschy, Alain; Guoli, Giacomo; and Mowka, Edmund J., Jr., 4,985,181, Cl. 261-87.000.

Gupta, Rajesh: *See—*
Grochowski, Edward; and Gupta, Rajesh, 4,985,640, Cl. 307-269.000.

Gurcan, Mustafa K., to U.S. Philips Corporation. Decision feedback equalizer and a method of operating a decision feedback equalizer. 4,985,902, Cl. 375-14.000.

Guskov, Valery V.: *See—*
Kozachevsky, Gennady G.; Boikov, Vladimir P.; Guskov, Valery V.; Molodan, Oleg I.; Sizova, Svetlana I.; and Gorodnichev, Jury N., 4,984,976, Cl. 425-35.000.

Gutierrez, Santos F. A.; Baratoff, Alexis; and Pohl, Wolfgang D., to International Business Machines Corporation. Spin-polarized scanning tunneling microscope. 4,985,627, Cl. 250-306.000.

Guy, M. Fleche: *See—*
Patrick, M. Fuertes; and Guy, M. Fleche, 4,985,553, Cl. 536-124.000.

Guyon, Claude: *See—*
Garret, Claude; Guyon, Claude; Plau, Bernard; and Taurand, Gerard, 4,985,419, Cl. 514-211.000.

H&S Machine & Supply Company, Inc.: *See—*
Scott, Ralph F., Jr.; and Locotos, Frank M., 4,984,938, Cl. 405-261.000.

Haag, Alfons: *See—*
Maisch, Gunter; Haag, Alfons; and Wood, Ken, 4,985,002, Cl. 439-607.000.

Habraken, Nicolaas J.; Van Randen, Age; De Vries, Franciscus; and De Jong, Fokke M., to INfill Systems B. V. Method for arranging lines in a floor level to be divided up into smaller rooms and elements suitable for this method. 4,984,408, Cl. 52-741.000.

Hadewe B.V.: *See—*
van der Werff, Jeichienus A.; and van Wijk, Robert, 4,985,013, Cl. 493-444.000.

Hado, Hisako: *See—*
Aosai, Fumito; Fukushima, Hiroshi; and Hado, Hisako, 4,985,472, Cl. 522-64.000.

Haeck, Hans H.: *See—*
Hamminga, Derk; Haeck, Hans H.; Van Wijngaarden, Ineke; and Wouters, Wouter, 4,985,420, Cl. 514-211.000.
van Wijngaarden, Ineke; Hamminga, Derk; Haeck, Hans H.; and Wouters, Wouter, 4,985,424, Cl. 514-220.000.

Haefele, Edelbert; and Kotter, Michael, to Kernforschungszenthrum Karlsruhe GmbH. Apparatus and process for continuously monitoring concentrations of gaseous components in gas mixtures, with exception of O_2. 4,985,126, Cl. 204-153.140.

Haefner, Hans W., to Pfister GmbH. Transducer for pressures and/or vibrations and method for manufacturing thereof. 4,984,467, Cl. 73-721.000.

Hafner, Hans W., to Pfister GmbH. Pressure sensor and method for manufacturing it. 4,984,468, Cl. 73-727.000.

Hafslund Nycomed Innovation AB: *See—*
Leunbach, Ib, 4,984,573, Cl. 128-653.000.

Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, to Ishihara Sangyo Kaisha Ltd. N-benzoyl-N-pyridyloxy phenyl urea compounds and pesticide compositions containing them. 4,985,449, Cl. 514-349.000.

Hagemann, Hermann: *See—*
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 4,985,063, Cl. 71-88.000.

Hagewood, John F.; and Darigo, Julius, to McCoy-Ellison, Inc. Apparatus for controlling tension in a traveling yarn. 4,984,341, Cl. 28-185.000.

Haghiri, Mohammad R.; Guntzburger, Philippe; and Le Queau, Marcel, to U. S. Philips Corporation. Spatio-temporal sub-sampling of digital video signals representing a succession of interlaced or sequential images, transmission of high-definition television images, and emission and reception stages for such a system. 4,985,767, Cl. 358-133.000.

Hagiwara, Hiroyuki: *See—*
Ohta, Tomohisa; Hagiwara, Hiroyuki; Kanbara, Hisashige; Dobashi, Akihiko; and Seki, Yasuyuki, 4,985,471, Cl. 522-27.000.

Hagner, George R. Circuit boards with recessed traces. 4,985,601, Cl. 174-261.000.

Hahnke, Manfred; Kuhn, Reinhard; and Buhler, Ulrich, to Hoechst Aktiengesellschaft. Multi-component mixtures of blue disperse azo dyes for the dyeing of synthetic fibers. 4,985,044, Cl. 8-639.000.

Hahnke, Manfred: *See—*
Buhler, Ulrich; Hahnke, Manfred; Kuhn, Reinhard; and Boos, Margarete, 4,985,043, Cl. 8-639.000.

Hajime Industries Ltd.: *See—*
Yoshida, Hajime, 4,984,886, Cl. 356-237.000.

Hakkarainen, Merja; and Taipale, Seppo, to Tamfelt Oy AB. Two-layer paper machine fabric. 4,985,084, Cl. 139-383.00A.

Halbert, John B., III, to VLSI Technology, Inc. Sequencing column select circuit for a random access memory. 4,985,872, Cl. 365-230.090.

Haldor Topsoe A/S: *See—*
Baden, Niels T.; Jensen, Ernst J.; and Larsen, Jorgen G., 4,985,230, Cl. 423-650.000.

Hale, John M., to Orbisphere Laboratories, Inc. Amperometric method and apparatus. 4,985,130, Cl. 204-415.000.
Hall, James E.: *See*—
Crawford, Paul A.; and Hall, James E., 4,984,478, Cl. 74-372.000.
Halldorsdottir, Hildur. Cuff for use when working with liquid material at a level above shoulder height. 4,984,299, Cl. 2-16.000.
Halloran, Daniel J., to Dow Corning Corporation. Odor-free perm. 4,985,240, Cl. 424-71.000.
Halm, Roland L.: *See*—
Chadwick, Kirk M.; and Halm, Roland L., 4,985,580, Cl. 556-481.000.
Hamada Enterprise & Co., Ltd.: *See*—
Hamada, Jiro, 4,984,800, Cl. 273-173.000.
Hamada, Jiro, to Hamada Enterprise & Co., Ltd. Head of golf club and method of producing the same. 4,984,800, Cl. 273-173.000.
Hamada, Mitsuo: *See*—
Saito, Masayuki; Yoshida, Keiji; and Hamada, Mitsuo, 4,985,483, Cl. 524-265.000.
Shimizu, Koji; and Hamada, Mitsuo, 4,985,277, Cl. 427-180.000.
Hamanaka, Naoki; Tanaka, Teruo; Omoda, Koichiro; Nagashima, Shigeo; Nakagoshi, Junji; and Ojima, Kazuo, to Hitachi, Ltd. Computer for synchronized read and write of vector data. 4,985,827, Cl. 364-200.000.
Hamann, Peter; and Kretzschmar, Gerhard, to Hoeschst Aktiengesellschaft. Elaiophylin derivatives, the use thereof as pharmaceuticals, and pharmaceuticals containing them. 4,985,451, Cl. 514-382.000.
Hamano, Itirou, to Shibuya Kogyo Co., Ltd. Article transfer apparatus with clamper. 4,984,680, Cl. 198-803.900.
Hamblen, David G.: *See*—
Morrison, Philip W., Jr.; Solomon, Peter R.; and Hamblen, David G., 4,985,858, Cl. 364-557.000.
Hamilton, Martin N. Drill with balanced inserts. 4,984,943, Cl. 408-144.000.
Hamlin, Charles R.: *See*—
Moser, Mark D.; Lawson, R. J.; Wang, Li; Parulekar, Vivekanand; Peer, Roger L.; and Hamlin, Charles R., 4,985,132, Cl. 208-65.000.
Hamminga, Derk; Haeck, Hans H.; Van Wijngaarden, Ineke; and Wouters, Wouter, to Duphar International Research B.V. 1,7-annelated indolecarboxylic acid esters and -amides. 4,985,420, Cl. 514-211.000.
Hamminga, Derk: *See*—
van Wijngaarden, Ineke; Hamminga, Derk; Haeck, Hans H.; and Wouters, Wouter, 4,985,424, Cl. 514-220.000.
Hammond, Kevin: *See*—
Elmes, Alfred R.; Hammond, Kevin; and Sherrington, David C., 4,985,468, Cl. 521-63.000.
Hammond, Timothy: *See*—
Barker, Sidney A.; Baggett, Neil; Stevenson, John; George, Raymond D.; De Courcy, David R.; Hammond, Timothy; and Bradley, Martin, 4,985,489, Cl. 524-594.000.
Hamner, Glen P.: *See*—
Cody, Ian A.; and Hamner, Glen P., 4,985,135, Cl. 208-114.000.
Hampton, James E.: *See*—
Bokerman, Gary N.; Hampton, James E.; and Uhlmann, John G., 4,985,579, Cl. 556-466.000.
Hananoi, Toshihiro: *See*—
Fujisawa, Hiromichi; Hatakeyama, Atsushi; Nakano, Yasuaki; Higashino, Junichi; and Hananoi, Toshihiro, 4,985,863, Cl. 364-900.000.
Takeda, Haruo; Hananoi, Toshihiro; and Kawachiya, Sachiko, 4,985,930, Cl. 382-56.000.
Handal, Victor H. Toilet sealing ring. 4,984,308, Cl. 4-252.00R.
Hann, Richard A.: *See*—
Beck, Nicholas C.; Gemmell, Peter A.; and Hann, Richard A., 4,985,398, Cl. 503-227.000.
Hanna, Marie R.: *See*—
Narula, Anubhav P. S.; Beck, Charles E. J.; and Hanna, Marie R., 4,985,403, Cl. 512-19.000.
Hanna, Thomas E.; and Brightbill, Keith E., to Rubbermaid Incorporated. Toolbox with peaked roof. 4,984,687, Cl. 206-373.000.
Hannon, John L., Jr., to Du Pont de Nemours, E. I., and Company. Mold fill coupling. 4,984,765, Cl. 251-5.000.
Hannon, John L., Jr., to Du Pont de Nemours, E. I., and Company. Method of fabricating a pinch valve. 4,985,191, Cl. 264-135.000.
Hansel, Eduard: *See*—
Heinz, Hans-Detlef; Hansel, Eduard; Meyer, Rolf-Volker; and Arend, Gunter, 4,985,534, Cl. 528-272.000.
Hanselmann, Daniel; Schlepfer, Walter; and Aebli, Jost, to Rieter Machine Works Ltd. Adjustable grid for the extraction arm of a bale-opener machine. 4,984,336, Cl. 19-80.00R.
Hansen, Paul E.; and Libbey, Christopher J., to Riker Laboratories, Inc. High elastic modulus bandage. 4,984,584, Cl. 128-898.000.
Hanson, William P.: *See*—
Jensik, Charles J.; and Hanson, William P., 4,985,655, Cl. 310-344.000.
Hanssler, Gerd: *See*—
Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, 4,985,452, Cl. 514-383.000.
Happle, Rudolf; and Hausen, Bjorn. Drug compositions for local treatment of alopecia areata. 4,985,464, Cl. 514-679.000.
Hara Health Industrial Co., Ltd.: *See*—
Hara, Zenzaburo, 4,984,313, Cl. 4-542.000.
Hara, Kenji; and Wada, Yoshio, to Kabushiki Kaisha Toshiba. Detector circuit including current attenuating circuit and capacitor. 4,985,685, Cl. 329-349.000.
Hara, Takeo: *See*—
Adachi, Ginya; Imanaka, Nobuhito; Aono, Hiromichi; Sugimoto, Eisuke; Sadaoka, Yoshihiko; Yasuda, Naoshi; Hara, Takeo; and Nagata, Masaki, 4,985,317, Cl. 429-191.000.
Hara, Zenzaburo, to Hara Health Industrial Co., Ltd. Head-held bubble bath apparatus. 4,984,313, Cl. 4-542.000.
Harada Electronics Industry: *See*—
Ochi, Koji; Harada, Masahide; and Kobayashi, Kunio, 4,984,519, Cl. 102-217.000.
Harada, Masahide: *See*—
Ochi, Koji; Harada, Masahide; and Kobayashi, Kunio, 4,984,519, Cl. 102-217.000.
Haraga, Kousuke: *See*—
Kato, Naoki; Tsukahara, Toshiro; Yanaura, Satoshi; and Haraga, Kousuke, 4,985,794, Cl. 360-107.000.
Haraguchi, Hiroshi: *See*—
Tsuji, Hitoshi; Haraguchi, Hiroshi; Hirata, Osamu; and Hashimoto, Hidetsuna, 4,985,374, Cl. 437-229.000.
Harashima, Ikuro: *See*—
Hirasawa, Tadashi; and Harashima, Ikuro, 4,985,198, Cl. 560-130.000.
Hari, Beverley A. Dough leveller/turntable device. 4,984,979, Cl. 425-374.000.
Harley, David N., to Titus Tool Company Limited. Connector for securing furniture panels at right angles to one another. 4,984,926, Cl. 403-8.000.
Harriman, Paul W. Pool games apparatus. 4,984,788, Cl. 273-22.000.
Hartley, Richard I.: *See*—
Cline, Harvey E.; Hartley, Richard I.; Ludke, Siegwalt; and Noujaim, Sharbel E., 4,985,834, Cl. 364-413.220.
Hartung, Joe; and Cox, William C., III. Trapeze mount for airborne tree trimming apparatus. 4,984,757, Cl. 244-137.400.
Hartwig, Jurgen: *See*—
Sommer, Herbert; Arlt, Dieter; Hartwig, Jurgen; Homeyer, Bernhard; and Matthaei, Hans-Detlef, 4,985,415, Cl. 514-118.000.
Hartzler, Jon D., to Du Pont de Nemours, E. I., and Company. Process for preparing poly (paraphenylene terephthalamide) fibers dyeable with cationic dyes. 4,985,046, Cl. 8-654.000.
Haruna, Katsunori: *See*—
Mochizuki, Shuji; Okuma, Atsushi; and Haruna, Katsunori, 4,985,523, Cl. 526-301.000.
Haruna, Kazuo; Ueda, Kanji; Inoue, Masahiro; and Someda, Hitosi, to Seitetsu Kagaku Co., Ltd.; and Bergwerksverband GmbH. Process for producing high purity oxygen gas from air. 4,985,052, Cl. 55-26.000.
Harvey, Harold H., Jr.: *See*—
Lunde, Gerald D.; and Harvey, Harold H., Jr., 4,984,488, Cl. 76-115.000.
Harvey, James R.: *See*—
Merriam, Charles N.; Mallon, Charles B.; Harvey, James R.; and Johnson, Robert N., 4,985,314, Cl. 428-694.000.
Hasbro, Inc.: *See*—
Price, Daniel W., 4,985,008, Cl. 446-308.000.
Hasegawa, Jun: *See*—
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 4,985,774, Cl. 358-213.190.
Hasegawa, Kaoru: *See*—
Mano, Hiroyuki; Takashi, Terumi; Fujisawa, Kazuhiro; Hasegawa, Kaoru; Matsumoto, Shinzo; and Fujita, Mitsuhisa, 4,985,698, Cl. 340-784.000.
Hasegawa, Keiichi: *See*—
Oshitani, Masahiko; Hasegawa, Keiichi; and Yufu, Hiroshi, 4,985,318, Cl. 429-223.000.
Hasegawa, Shizuo: *See*—
Maeshima, Katsuyoshi; Takeda, Atsushi; Arimoto, Shinobu; and Hasegawa, Shizuo, 4,985,760, Cl. 358-80.000.
Hasegawa, Yo: *See*—
Tabata, Munehiro; Hayashi, Chiharu; Isozaki, Yasuhito; Okano, Kazuyuki; and Hasegawa, Yo, 4,985,071, Cl. 75-246.000.
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Traction control apparatus. 4,985,836, Cl. 364-426.020.
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Traction control apparatus. 4,985,838, Cl. 364-426.020.
Hashimoto Forming Industry Co., Ltd.: *See*—
Hayano, Koichiro, 4,984,851, Cl. 301-37.00P.
Hashimoto, Hidetsuna: *See*—
Tsuji, Hitoshi; Haraguchi, Hiroshi; Hirata, Osamu; and Hashimoto, Hidetsuna, 4,985,374, Cl. 437-229.000.
Hashimoto, Kenji: *See*—
Ichikawa, Rinjiro; and Hashimoto, Kenji, 4,985,285, Cl. 428-1.000.
Hashimoto, Michiaki: *See*—
Uchino, Shoichi; Ueno, Takumi; Iwayanagi, Takao; Nonogaki, Saburo; and Hashimoto, Michiaki, 4,985,344, Cl. 430-325.000.
Hashimoto, Noboru; Sawada, Yasushi; Yoden, Hiroyoshi; Deki, Shigehito; and Takahashi, Hisamitsu, to Matsushita Electric Works, Ltd. Process for producing aluminum nitride powders. 4,985,225, Cl. 423-412.000.
Hashimoto, Seiji, to Canon Kabushiki Kaisha. Signal processing system having selected output from plural readout devices. 4,985,758, Cl. 358-44.000.

Hashimoto, Yoshihiro; Yamazaki, Shoji; and Katoh, Shunsuke, to Advantest Corporation. Test equipment for a low current IC. 4,985,672, Cl. 324-158.00R.

Hashimoto, Yukio: *See*—
Sawamura, Norio; Matsuo, Takaharu; and Hashimoto, Yukio, 4,985,358, Cl. 435-134.000.

Hass, Robert D., Jr.; Hodder, Brian G.; and Yakymyshyn, Christopher P., to Meditor Corporation. Detachable liquid level monitoring apparatus and method. 4,984,462, Cl. 73-293.000.

Hata, Hajime; and Kanbara, Hajime, to Shikoku Chemicals Corporation. Process for preparation of aluminum borate whisker. 4,985,222, Cl. 423-279.000.

Hata, Kazuyoshi; and Tanaka, Masami, to Minolta Camera Kabushiki Kaisha. Zoom lens system. 4,984,876, Cl. 350-423.000.

Hatakeyama, Atsushi: *See*—
Fujisawa, Hiromichi; Hatakeyama, Atsushi; Nakano, Yasuaki; Higashino, Junichi; and Hananoi, Toshihiro, 4,985,863, Cl. 364-900.000.

Hatchwell, Leora: *See*—
Singer, Norman; Wilcox, Reed; Podolski, Joseph S.; Chang, Hsien-Hsin; Pookote, Suseelan; Dunn, John M.; and Hatchwell, Leora, 4,985,270, Cl. 426-515.000.

Hato, Hitoshi: *See*—
Yamamoto, Tomiaki; Murayama, Akio; Kondo, Susumu; Hato, Hitoshi; Kamagami, Shinichi; and Matsumoto, Shoichi, 4,984,874, Cl. 350-334.000.

Hatsuda, Takumi: *See*—
Kimura, Kazumasa; Hatsuda, Takumi; Irie, Yoshio; and Shimomura, Tadao, 4,985,514, Cl. 526-88.000.

Haugen, Hartwick: *See*—
Croft, Thomas S.; and Haugen, Hartwick, 4,985,475, Cl. 523-173.000.

Hausen, Bjorn: *See*—
Happle, Rudolf; and Hausen, Bjorn, 4,985,464, Cl. 514-679.000.

Hauslaib, Wolfgang; and Gomoll, Guenter, to Mannesmann AG. Laminated platen bar for noise attenuation in matrix printers. 4,984,917, Cl. 400-656.000.

Hawkins, Melvin K.: *See*—
Fearnot, Neal E.; Hawkins, Melvin K.; and Sisken, Richard B., 4,985,022, Cl. 604-282.000.

Hawkins, William G.: *See*—
Drake, Donald J.; and Hawkins, William G., 4,985,710, Cl. 346-1.100.

Hayakawa, Isao; Atarashi, Shohgo; Imamura, Masazumi; Yokohama, Shuichi; Higashihashi, Nobuyuki; Sakano, Katsuichi; and Ohshima, Masayuki, to Daiichi Seiyaku Co., Ltd. Optically active pyridobenzoxazine derivatives and intermediates thereof. 4,985,557, Cl. 540-598.000.

Hayakawa, Kunio; Furuya, Hiromi; Shimada, Hisanori; Nakata, Masahiro; Kodera, Kaoru; Oohara, Kouji; and Akagi, Nobuo, to Ricoh Company, Ltd. Recording material. 4,985,345, Cl. 430-335.000.

Hayakawa, Shingo: *See*—
Fujibayashi, Kazuo; Hayakawa, Shingo; and Kiyohara, Shuchi, 4,985,726, Cl. 354-432.000.

Hayakawa, Tadashi: *See*—
Naya, Koutarou; Shiinoki, Kazuaki; Hayakawa, Tadashi; Masujima, Kiyoshi; Uchida, Riichi; and Matsubara, Katsumi, 4,984,974, Cl. 418-87.000.

Hayakawa, Toshio. Multi-task printer. 4,984,914, Cl. 400-585.000.

Hayakawa, Yoshihide: *See*—
Koizumi, Shigeo; and Hayakawa, Yoshihide, 4,985,339, Cl. 430-270.000.

Hayano, Koichiro, to Hashimoto Forming Industry Co., Ltd. Wheel cover for automobiles. 4,984,851, Cl. 301-37.00P.

Hayashi, Chiharu: *See*—
Tabata, Munehiro; Hayashi, Chiharu; Isozaki, Yasuhito; Okano, Kazuyuki; and Hasegawa, Yo, 4,985,071, Cl. 75-246.000.

Hayashi, Eiji: *See*—
Abe, Takashi; and Hayashi, Eiji, 4,985,556, Cl. 540-484.000.

Hayashi, Hidechika, to Tosoh Corporation. Biochemical reaction analyzing apparatus. 4,985,207, Cl. 422-102.000.

Hayashi, Ikuo: *See*—
Idogaki, Takaharu; Hayashi, Ikuo; Ishihara, Toshihisa; Inoue, Hideo; and Sugitani, Tatsuo, 4,984,463, Cl. 73-516.00R.

Hayashi, Kenichi; and Matsuoka, Yoshito, to Asahi Kasei Kogyo Kabushiki Kaisha. Fluoroelastomer having excellent processability. 4,985,520, Cl. 526-254.000.

Hayashi, Masaaki: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 4,984,575, Cl. 128-660.030.

Hayashi, Toshihiko, to Nissan Motor Company, Limited. Process of installing a resonator for an automobile. 4,984,350, Cl. 29-525.100.

Haynes, Joel E., to Alco Standard Corporation. Fluid flow sensor. 4,984,461, Cl. 73-249.000.

Hayward, Alan T. J.; and Cousins, Terence. Vortex-shedding flowmeters. 4,984,470, Cl. 73-861.220.

Hazard, Gary M., to N.H.C., Inc. Low emissions wood burning stove. 4,984,560, Cl. 126-169.000.

Hazlett, Randy D.: *See*—
Cullick, Alvin S.; and Hazlett, Randy D., 4,984,635, Cl. 166-261.000.

Heerman, Marcel, to Siemens Aktiengesellschaft. Printed circuit board having an injection molded substrate. 4,985,600, Cl. 174-255.000.

Heichler, Johannes, to ANT Nachrichtentechnik GmbH. Bus coupling circuit. 4,985,903, Cl. 375-36.000.

Heidbrier, Warren G.: *See*—
Daghe, Joe L.; Eckel, John D.; and Heidbrier, Warren G., 4,984,767, Cl. 251-297.000.

Heinz, Hans-Detlef; Hansel, Eduard; Meyer, Rolf-Volker; and Arend, Gunter, to Bayer Aktiengesellschaft. Polyetheramide hotmelt-adhesives. 4,985,534, Cl. 528-272.000.

Helder, Edward R.: *See*—
Renfrow, Denny M.; Schumacher, Francis X.; and Helder, Edward R., 4,985,639, Cl. 307-262.000.

Helfritch, Dennis J.; and Efthimion, Philip C., to Research-Cottrell, Inc. Removal of nitrogen oxides from waste gases. 4,985,219, Cl. 423-235.000.

Hellard, Guy; and Bedes, Amour, to Aerospatiale Societe Nationale Industrielle. Tube for the circulation of a flammable fluid, and conduit made from such tubes. 4,985,801, Cl. 361-215.000.

Hellein, Christine. Manicure shield. 4,984,592, Cl. 132-285.000.

Hemmerling, Wolfgang: *See*—
Wingen, Rainer; Dubal, Hans-Rolf; Hemmerling, Wolfgang; Muller, Ingrid; and Ohlendorf, Dieter, 4,985,172, Cl. 252-299.670.

Henderson, Dewey D., to Dayco Products, Inc. Belt tensioner and method of making the same. 4,985,010, Cl. 474-135.000.

Hendler, Sheldon S. Method for inhibiting viral and retroviral infections. 4,985,465, Cl. 514-712.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Reckziegel, Erich, 4,984,949, Cl. 412-8.000.

Henrotte, Jean-Georges: *See*—
Gueyne, Jean; Seguin, Marie-Christine; and Henrotte, Jean-Georges, 4,985,405, Cl. 514-008.000.

Henry, Cyrus P.; and Spinelli, Harry J., to Du Pont de Nemours, E. I., and Company. Branched polymers as fuel oil additives. 4,985,160, Cl. 252-51.50R.

Herbrechtsmeier, Peter; Wieners, Gerhard; Kuhls, Jurgen; Tschacher, Manfred; and Fitz, Herbert, to Hoechst Aktiengesellschaft. Optical waveguide. 4,984,870, Cl. 350-96.340.

Herbst, Joseph A.: *See*—
Chu, Pochen; Herbst, Joseph A.; Klocke, Donald J.; and Vartuli, James, 4,985,223, Cl. 423-328.000.

Herodes, Victor: *See*—
Marrs, Samuel M.; Herodes, Victor; and Ransom, David, 4,984,752, Cl. 242-107.40A.

Herolf, Olof, to OSA AB. Method for handling and transporting logs from felling site to consumer, and road vehicle for carrying out the method. 4,984,961, Cl. 414-786.000.

Heron, Andrew P.: *See*—
Morrison, David G.; Heron, Andrew P.; and Beaumont, David O., 4,985,766, Cl. 358-133.000.

Herrmann, Udo: *See*—
Claussen, Uwe; and Herrmann, Udo, 4,985,124, Cl. 204-72.000.

Herron, William L.: *See*—
Vadacchino, Joseph; and Herron, William L., 4,984,835, Cl. 292-341.160.

Hertler, Walter R.: *See*—
Anderson, Albert G.; Hertler, Walter R.; Wheland, Robert C.; and Chen, Yuan Yu G., 4,985,332, Cl. 430-176.000.

Hetherington, Ricky C.: *See*—
Webb, David A., Jr.; Fite, David B.; Hetherington, Ricky C.; McKeen, Francis X.; Firstenberg, Mark A.; Murray, John E.; Manley, Dwight P.; Salett, Ronald M.; and Fossum, Tryggve, 4,985,825, Cl. 364-200.000.

Hewlett-Packard: *See*—
Rhind, William G.; and Carder, Norman G., 4,985,900, Cl. 375-10.000.

Hewlett-Packard Company: *See*—
Boyd, David W., 4,984,882, Cl. 350-632.000.
Frankenreiter, Michael, 4,984,577, Cl. 128-681.000.
Renfrow, Denny M.; Schumacher, Francis X.; and Helder, Edward R., 4,985,639, Cl. 307-262.000.
Schulenberg, Andreas; and Schraag, Martin, 4,984,576, Cl. 128-661.070.

Heywood, Derek W.; and Howarth, Stuart B., to BIP Chemicals, Ltd. Treatment of woollen textile material. 4,985,040, Cl. 8-128.100.

Hi-Tech Engineering and Machine Company, Inc.: *See*—
Landers, Adrian L.; and Landers, Richard D., 4,984,614, Cl. 144-220.000.

Hibino, Hiroki: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 4,984,575, Cl. 128-660.030.

Hicks, Darrell D.: *See*—
Watkins, James W.; and Hicks, Darrell D., 4,985,587, Cl. 560-25.000.

Hideaki, Kawamura, to Canon Kabushiki Kaisha. Image processing system for forming a slantwise-mapped or rotated modified image of an original image. 4,985,849, Cl. 364-518.000.

Higa, Teruo, to Saken Corporation; and Corporation Limited Rioko. Soil conditioners. 4,985,060, Cl. 71-6.000.

Higa, Yoshitaka, to Sansho Seiyaku Co., Ltd. External preparations of melanogenesis-inhibitory agent. 4,985,255, Cl. 424-583.000.

Higashi, Takayuki: *See*—
Minai, Masayoshi; and Higashi, Takayuki, 4,985,590, Cl. 560-184.000.

Higashida, Osamu: *See*—
Kumagai, Yuugo; Tan, Ryouji; Ikeda, Takashi; Fujii, Tetsuya; Okada, Chiaki; Higashida, Osamu; Sugitani, Hatuo; and Fukasawa, Masato, 4,985,328, Cl. 430-110.000.

Higashihashi, Nobuyuki: *See*—
Hayakawa, Isao; Atarashi, Shohgo; Imamura, Masazumi; Yokohama, Shuichi; Higashihashi, Nobuyuki; Sakano, Katsuichi; and Ohshima, Masayuki, 4,985,557, Cl. 540-598.000.

Higashino, Junichi: *See*—
Fujisawa, Hiromichi; Hatakeyama, Atsushi; Nakano, Yasuaki; Higashino, Junichi; and Hananoi, Toshihiro, 4,985,863, Cl. 364-900.000.

Higashino, Nobuo: *See*—
Noguchi, Michio; Mori, Kazushige; Higashino, Nobuo; and Sunada, Motoki, 4,984,957, Cl. 414-723.000.

Higashiyama, Yasuhiko: *See*—
Asada, Toshiyuki; Higashiyama, Yasuhiko; Nakawaki, Yasunori; Suzuki, Toshitake; Abe, Akiharu; and Moriguchi, Naoki, 4,985,011, Cl. 475-278.000.

Higaski, Nobuaki; Ishida, Masamitsu; and Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus and reproduction condition designating apparatus. 4,985,630, Cl. 250-327.200.

Hihara, Toshio: *See*—
Himeno, Kiyoshi; Hihara, Toshio; Shimizu, Kanzi; and Shimizu, Yukiharu, 4,985,545, Cl. 534-618.000.

Hilbig, Josef; Welt, Guenther; and Ziegelmayer, Manfred, to Hoechst Aktiengesellschaft. Process for separating solvents used in the purification of products. 4,985,152, Cl. 210-771.000.

Hildebrand, Heinz; Zitzmann, Werner; Arlt, Dieter; and Kolbl, Geinz, to Bayer Aktiengesellschaft. Preparation of cyclopropanecarboxylic acids. 4,985,364, Cl. 435-254.000.

Hilger, Ronald O.: *See*—
Peterson, Samuel F.; Hilger, Ronald O.; and Kalnins, William, 4,984,583, Cl. 128-66.000.

Hilti Aktiengesellschaft: *See*—
Bergner, Arndt, 4,984,945, Cl. 411-30.000.

Himeno, Kiyoshi; Hihara, Toshio; Shimizu, Kanzi; and Shimizu, Yukiharu, to Mitsubishi Kasei Corporation. Water-soluble formazan colorant containing reactive group and method of dyeing by its use. 4,985,545, Cl. 534-618.000.

Himont Italia s.r.l.: *See*—
Fornasier, Roberto; Tornatore, Massimo; and Chapoy, Larry L., 4,985,539, Cl. 528-423.000.

Hino Judosha Kogyo Kabushiki Kaisha: *See*—
Ariga, Masahiro; Takise, Saburou; and Fujii, Aturo, 4,984,554, Cl. 123-516.000.

Hinrigs, Wouter L. J.: *See*—
Lommen, Etienne J. C. M. P.; Wildevuur, Charles R. H.; and Hinrigs, Wouter L. J., 4,985,036, Cl. 623-15.000.

Hintzer, Klaus: *See*—
Blickie, Peter; Hintzer, Klaus; Schwertfeger, Werner; and Strutz, Heinz, 4,985,594, Cl. 562-851.000.

Hirai, Toshiaki: *See*—
Akimoto, Kazuo; Hirai, Toshiaki; and Tanikawa, Miyoshi, 4,985,724, Cl. 354-400.000.

Hirai, Toshio: *See*—
Kurosawa, Hideyuki; Hirai, Toshio; Yamane, Hisanori; and Yamashita, Tsutomu, 4,985,117, Cl. 156-659.100.

Hiraiwa, Kouzi: *See*—
Momose, Yutaka; Watanabe, Tetsumi; Hiraiwa, Kouzi; and Mizuno, Tomokimi, 4,984,428, Cl. 60-517.000.

Hiraiwa, Yoshitaka: *See*—
Nakano, Masao; Mori, Keiichi; Hiraiwa, Yoshitaka; Iizuka, Shoji; Shima, Shozo; and Nakamura, Yukio, 4,984,904, Cl. 374-139.000.

Hiramatsu, Takeo; and Tanaka, Yuichi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Control system for an automatic transmission of a motor vehicle. 4,984,483, Cl. 74-866.000.

Hirano, Masato: *See*—
Hirano, Mitsunori; Hirano, Masato; Yagihara, Morio; and Okada, Hisashi, 4,985,348, Cl. 430-434.000.

Hirano, Mitsunori; Hirano, Masato; Yagihara, Morio; and Okada, Hisashi, to Fuji Photo Film Co., Ltd. Process for photographic development processing. 4,985,348, Cl. 430-434.000.

Hirasawa, Kenji: *See*—
Komatsu, Fumito; and Hirasawa, Kenji, 4,985,790, Cl. 360-96.500.

Hirasawa, Masahide, to Canon Kabushiki Kaisha. Recording and/or reproducing apparatus in which a reference signal is used in a recording and/or reproducing part as well as in another part. 4,985,781, Cl. 358-324.000.

Hirasawa, Tadashi; and Harashima, Ikuro, to G-C Dental Industrial Corp. Tooth-adhesive compounds. 4,985,198, Cl. 560-130.000.

Hirata, Makizo: *See*—
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,984,417, Cl. 56-11.300.

Hirata, Osamu: *See*—
Tsuji, Hitoshi; Haraguchi, Hiroshi; Hirata, Osamu; and Hashimoto, Hidetsuna, 4,985,374, Cl. 437-229.000.

Hirayama, Keiichi: *See*—
Kawabe, Shigehisa; and Hirayama, Keiichi, 4,985,756, Cl. 358-22.000.

Hirohara, Hideo: *See*—
Mitsuda, Satoshi; Matsuo, Noritada; and Hirohara, Hideo, 4,985,365, Cl. 435-280.000.

Hirokane, Junji: *See*—
Ohta, Kenji; Takahashi, Akira; Katayama, Hiroyuki; Hirokane, Junji; and Murakami, Yoshiteru, 4,985,885, Cl. 369-275.100.

Hirose, Akira: *See*—
Matsuyama, Futoshi; Hirose, Akira; and Takei, Toshiyuki, 4,984,351, Cl. 29-568.000.

Hirose, Kunitaka: *See*—
Sugita, Norifumi; Niimura, Koichi; Oguchi, Yoshiharu; Hirose, Kunitaka; Matsunaga, Kenichi; Oohara, Minoru; Muto, Shigeaki; Kakuchi, Junji; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 4,985,543, Cl. 530-396.000.

Hirota, Kunio: *See*—
Sato, Takeaki; Kozaki, Yoshihiro; and Hirota, Kunio, 4,984,443, Cl. 72-67.000.

Hirota, Takao: *See*—
Kawakami, Tetsuji; Imai, Akihiro; Taguchi, Nobuyoshi; Murata, Yukichi; and Hirota, Takao, 4,985,396, Cl. 503-227.000.

Hirotsu, Kenji: *See*—
Ataka, Kikuo; Imaoka, Koji; Yoshii, Kiyotaka; and Hirotsu, Kenji, 4,985,596, Cl. 564-258.000.

Hisabe, Yasushi: *See*—
Osada, Noriyuki; Hisabe, Yasushi; Ohtani, Toshihiro; and Kanamori, Toshiya, 4,984,881, Cl. 350-616.000.

Hitachi Chemical Co., Ltd.: *See*—
Kakumaru, Hajime; Minami, Yoshitaka; Kubota, Naohiro; and Mashimo, Shinya, 4,985,564, Cl. 546-104.000.
Kumagai, Yuugo; Tan, Ryouji; Ikeda, Takashi; Fujii, Tetsuya; Okada, Chiaki; Higashida, Osamu; Sugitani, Hatuo; and Fukasawa, Masato, 4,985,328, Cl. 430-110.000.
Ohta, Tomohisa; Hagiwara, Hiroyuki; Kanbara, Hisashige; Dobashi, Akihiko; and Seki, Yasuyuki, 4,985,471, Cl. 522-27.000.

Hitachi Construction Machinery Co., Ltd.: *See*—
Kageyama, Naoki; Kuchiwaki, Hiroji; Ito, Junki; Sakuma, Nobumitsu; and Ogura, Yukio, 4,984,567, Cl. 128-660.020.
Kusumi, Hiroshi; Nozaki, Satoshi; and Yosida, Muneo, 4,984,936, Cl. 405-232.000.

Hitachi, Ltd.: *See*—
Fujimoto, Kotaro; Tanaka, Yoshie; Kawahara, Hironobu; and Sato, Yoshiaki, 4,985,113, Cl. 156-643.000.
Fujisawa, Hiromichi; Hatakeyama, Atsushi; Nakano, Yasuaki; Higashino, Junichi; and Hananoi, Toshihiro, 4,985,863, Cl. 364-900.000.
Hamanaka, Naoki; Tanaka, Teruo; Omoda, Koichiro; Nagashima, Shigeo; Nakagoshi, Junji; and Ojima, Kazuo, 4,985,827, Cl. 364-200.000.
Ichikawa, Akira; Asakawa, Yoshiaki; Komatsu, Akio; and Oohira, Eiji, 4,985,923, Cl. 381-38.000.
Irube, Makoto; Nakajima, Junjiro; Umehara, Hajime; Tada, Nobuo; and Ajima, Masayoshi, 4,985,199, Cl. 376-442.000.
Ishihara, Heigo; Osaki, Akira; Nagashiro, Waichi; and Maeda, Fuzio, 4,985,295, Cl. 428-213.000.
Kaneyasu, Masayoshi; and Kurihara, Nobuo, 4,984,545, Cl. 123-399.000.
Kano, Kiyoshi; Kaku, Nobuyuki; Shigemura, Tatsuya; Tanaka, Yoshiyuki; Fukagawa, Yoshihiro; and Uesugi, Masaki, 4,985,788, Cl. 360-85.000.
Maeda, Naohiro, 4,984,766, Cl. 251-129.110.
Mano, Hiroyuki; Takashi, Terumi; Fujisawa, Kazuhiro; Hasegawa, Kaoru; Matsumoto, Shinzo; and Fujita, Mitsuhisa, 4,985,698, Cl. 340-784.000.
Matuura, Hidekazu; Miyadera, Yasuo; and Kato, Toshihiko, 4,985,509, Cl. 525-426.000.
Miyamoto, Eiji, 4,985,869, Cl. 365-226.000.
Miyazaki, Chuuichi; Akatsu, Toshio; and Mori, Sadao, 4,984,891, Cl. 356-358.000.
Nakamura, Shigeru; Tsunoda, Yoshito; and Maeda, Takeshi, 4,985,616, Cl. 235-494.000.
Naya, Koutarou; Shiinoki, Kazuaki; Hayakawa, Tadashi; Masujima, Kiyoshi; Uchida, Riichi; and Matsubara, Katsumi, 4,984,974, Cl. 418-87.000.
Ochi, Koji; Harada, Masahide; and Kobayashi, Kunio, 4,984,519, Cl. 102-217.000.
Okudaira, Sadayuki; Kawakami, Hiroshi; Kure, Tokuo; Tsujimoto, Kazunori; and Tachi, Shinichi, 4,985,114, Cl. 156-643.000.
Otsubo, Toru; Tokuda, Mitsuo; Yamaguchi, Yasuhiro; Sasaki, Ichirou; Ohara, Kazuhiro; Usuami, Hirohisa; and Azuma, Junzou, 4,985,109, Cl. 156-345.000.
Saito, Atsushi; Ojima, Masahiro; and Ito, Masaru, 4,985,881, Cl. 369-13.000.
Saito, Chuichi; Ojima, Kazuhira; and Ohsumi, Yoshihiro, 4,984,673, Cl. 198-333.000.
Saito, Cyuichi; Ishida, Akio; Kaneko, Tatsuya; and Kimura, Toshihiko, 4,984,672, Cl. 198-333.000.
Shimizu, Naohiko; and Sawamoto, Hideo, 4,985,828, Cl. 364-200.000.
Shioya, Makoto; and Adachi, Masao, 4,985,847, Cl. 364-516.000.
Takeda, Haruo; Hananoi, Toshihiro; and Kawachiya, Sachiko, 4,985,930, Cl. 382-56.000.
Tsuboi, Yukitoshi; and Okamoto, Teiji, 4,985,784, Cl. 358-342.000.
Uchida, Hiroyasu; Abe, Tetsuaki; and Ishizawa, Hiroaki, 4,984,628, Cl. 165-26.000.
Uchino, Shoichi; Ueno, Takumi; Iwayanagi, Takao; Nonogaki, Saburo; and Hashimoto, Michiaki, 4,985,344, Cl. 430-325.000.

Hitachi Maxell, Ltd.: *See*—
Doi, Hajime, 4,985,799, Cl. 360-133.000.

Kamezaki, Hisamitsu; and Tuburaya, Yoshitane, 4,985,289, Cl. 428-64.000.
Hitachi Metals, Ltd.: *See—*
Iwasaki, Katsunori; Nozawa, Yasuto; and Tanigawa, Shigeho, 4,985,086, Cl. 148-101.000.
Yoshizawa, Yoshihito; and Yamauchi, Kiyotaka, 4,985,089, Cl. 148-303.000.
Hitachi Video Engineering Inc.: *See—*
Kano, Kiyoshi; Kaku, Nobuyuki; Shigemura, Tatsuya; Tanaka, Yoshiyuki; Fukagawa, Yoshihiro; and Uesugi, Masaki, 4,985,788, Cl. 360-85.000.
Hittich, Reinhard: *See—*
Eidenschink, Rudolf; Krause, Joachim; Wachtler, Andreas; Hittich, Reinhard; Scheuble, Bernhard; Weber, Georg; and Kurmeier, Hans-Adolf, 4,985,583, Cl. 558-431.000.
Hmida, Hedi; and Duhamel, Pierre, to ETAT Francais represente par le Ministre Delegue des Postes et Telecommunications (Centre National d'Etudes des Telecommunications). Binary adder circuit with improved inputs. 4,985,862, Cl. 364-786.000.
Hodder, Brian G.: *See—*
Hass, Robert D., Jr.; Hodder, Brian G.; and Yakymyshyn, Christopher P., 4,984,462, Cl. 73-293.000.
Hodge, Robert B. Water sprinkler with variable stream-distance adjustment. 4,984,740, Cl. 239-232.000.
Hoechst AG: *See—*
Wingen, Rainer; Dubal, Hans-Rolf; Hemmerling, Wolfgang; Muller, Ingrid; and Ohlendorf, Dieter, 4,985,172, Cl. 252-299.670.
Hoechst Aktiengesellschaft: *See—*
Blickle, Peter; Hintzer, Klaus; Schwertfeger, Werner; and Strutz, Heinz, 4,985,594, Cl. 562-851.000.
Erpenbach, Heinz; Lork, Winfried; Seidel, Andreas; and Prinz, Peter, 4,985,383, Cl. 502-24.000.
Hahnke, Manfred; Kuhn, Reinhard; and Buhler, Ulrich, 4,985,044, Cl. 8-639.000.
Herbrechtsmeier, Peter; Wieners, Gerhard; Kuhls, Jurgen; Tschacher, Manfred; and Fitz, Herbert, 4,984,870, Cl. 350-96.340.
Hilbig, Josef; Welt, Guenther; and Ziegelmayer, Manfred, 4,985,152, Cl. 210-771.000.
Rode, Klaus; Mohr, Dieter; Frass, Werner; and Gersdorf, Joachim, 4,985,341, Cl. 430-287.000.
Rohrmann, Jurgen; and Antberg, Martin, 4,985,576, Cl. 556-435.000.
Staendeke, Horst; and Themmler, Ursus, 4,985,221, Cl. 423-265.000.
Wirtz, Herbert; Feustel, Michael; and Balzer, Juliane, 4,985,048, Cl. 44-394.000.
Hoenl, Hans: *See—*
Bronstert, Klaus; Hoenl, Hans; Echte, Adolf; and Klaerner, Peter, 4,985,503, Cl. 525-193.000.
Hoeschst Aktiengesellschaft: *See—*
Hamann, Peter; and Kretzschmar, Gerhard, 4,985,451, Cl. 514-382.000.
Hofele, Franz. Method of making a broach. 4,985,609, Cl. 219-69.170.
Hoff, Elmar: *See—*
Gemeinhardt, Hermann; Hoff, Elmar; and Schurmann, Erich, 4,984,630, Cl. 165-173.000.
Hoffacker, Franz; Kovacic, Guido; and Luhrig, Hermann, to Agfa-Gevaert Aktiengesellschaft. Spool for strip-form recording substrates, in particular for photographic films. 4,984,751, Cl. 242-74.000.
Hoffman, Ronald J., to Inertia Dynamics Corporation. Drum assembly for a centrifugal clutch. 4,984,669, Cl. 192-110.00R.
Hoffmann, Glenn E.; and Scarlett, John C., to Midrex International BV, Rotterdam, Zurich Branch. Method and apparatus for smelting iron oxide. 4,985,068, Cl. 75-501.000.
Hofler, Heinrich; and Bergmann, Eckhard, to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V. Laser interferometer for interferometric length measurements including an automatic-compensating circuit. 4,984,898, Cl. 356-358.000.
Hofman, Richard W.: *See—*
Groya, Robert J.; and Hofman, Richard W., 4,984,720, Cl. 222-531.000.
Hofmann, Klaus: *See—*
Buhler, Ulrich; and Hofmann, Klaus, 4,985,045, Cl. 8-639.000.
Hofmann, Otto, to Messerschmitt-Boelkow-Blohm GmbH. Apparatus for the optical scanning of a spherical or semispherical space. 4,984,892, Cl. 356-372.000.
Hohlein, Peter: *See—*
Blum, Harald; Hohlein, Peter; Sonntag, Michael; and Wellner, Wolfgang, 4,985,506, Cl. 525-298.000.
Holland Colours Apeldoorn BV: *See—*
Bes, Richard F. T.; and Knol, Jan D., 4,985,187, Cl. 264-13.000.
Hollenstein, Helmut: *See—*
Rock, Erich; and Hollenstein, Helmut, 4,984,929, Cl. 403-230.000.
Holmwood, Graham: *See—*
Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, 4,985,452, Cl. 514-383.000.
Holset Engineering Company Limited: *See—*
McKean, Peter, 4,984,965, Cl. 415-155.000.
Holtz, Leonard. Tap wrench. 4,984,942, Cl. 408-127.000.
Homeyer, Bernhard: *See—*
Sommer, Herbert; Arlt, Dieter; Hartwig, Jurgen; Homeyer, Bernhard; and Matthaei, Hans-Detlef, 4,985,415, Cl. 514-118.000.
Homma, Katsuhisa: *See—*
Nikaido, Masaru; Homma, Katsuhisa; and Kinoshita, Tadayoshi, 4,985,712, Cl. 346-76.0PH.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Horiike, Satoru; Takemura, Hiroo; and Yamamoto, Toshiteru, 4,984,650, Cl. 180-227.000.
Kimura, Naomasa; Nishiguchi, Masayuki; and Noguchi, Minoru, 4,985,108, Cl. 156-272.400.
Ohta, Yoshimasa; and Arakawa, Masayasu, 4,984,349, Cl. 29-430.000.
Shibahata, Yasuji, 4,984,482, Cl. 74-650.000.
Shinoda, Akihisa; Fujita, Motohiro; Tsusaka, Haruo; Yonezawa, Makoto; and Nakano, hiroyuki, 4,984,539, Cl. 123-41.420.
Honda, Iwakazu; and Yui, Yuhi, to Sharp Kabushiki Kaisha. Waste toner collecting container provided with corona charger. 4,985,734, Cl. 355-298.000.
Honda, Toshio: *See—*
Akiyama, Setsuo; Monobe, Hisanobu; Naito, Kazuo; Honda, Toshio; and Tanaka, Kazuo, 4,985,510, Cl. 525-427.000.
Hondo, Toshinobu: *See—*
Saito, Muneo; Yamauchi, Yoshio; Kashiwazaki, Hiromi; Sugawara, Michiaki; and Hondo, Toshinobu, 4,984,602, Cl. 137-487.500.
Honeywell Inc.: *See—*
Wittenburg, Timothy M., 4,985,854, Cl. 364-522.000.
Hoodlebrink, Merlin P.: *See—*
Fox, Robert J.; and Hoodlebrink, Merlin P., 4,985,146, Cl. 210-413.000.
Hoog, Josef T.: *See—*
Warenback, Douglas H.; and Hoog, Josef T., 4,984,954, Cl. 414-416.000.
Hoogovens Groep B.V.: *See—*
Van Perlstein, Erik B.; and den Hartog, Huibert W., 4,985,090, Cl. 148-320.000.
Hooker, Brent D.: *See—*
Woods, Ralf D.; and Hooker, Brent D., 4,985,674, Cl. 324-158.00R.
Hoover, James R.; and Spector, George. Life cut. 4,984,368, Cl. 30-231.000.
Hopkins, William M.: *See—*
Shepler, Peter R.; Gammon, Nathan A.; Hopkins, William M.; Koerner, James E.; and Schmaltx, Charles K., 4,984,616, Cl. 152-209.00A.
Hori, Kazunobu: *See—*
Ogawa, Fumihiko; Hori, Kazunobu; Asai, Keiichi; and Watanabe, Tomoyoshi, 4,984,842, Cl. 296-155.000.
Hori, Mitsuaki: *See—*
Saigo, Takeshi; Tokuya, Tomohiko; Kamimura, Haruo; Hori, Mitsuaki; and Yasuoka, Hidenori, 4,984,829, Cl. 285-334.000.
Horie, Hajime, to Tokyo Seimitsu Co., Ltd. Method and system for inspecting plural semiconductor devices. 4,985,673, Cl. 324-158.00R.
Horie, Shinji; Shimizu, Hideto; Ohmori, Michio; and Yui, Hiroshi, to Mitsubishi Petrochemical Co., Ltd.; and Ricoh Company Ltd. Blade for electrophotographic apparatus. 4,984,326, Cl. 15-256.500.
Horiike, Satoru; Takemura, Hiroo; and Yamamoto, Toshiteru, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 4,984,650, Cl. 180-227.000.
Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Shading elmination method for an image read-out apparatus. 4,985,629, Cl. 250-327.200.
Horikoshi, Kouki: *See—*
Inoue, Akira; and Horikoshi, Kouki, 4,985,363, Cl. 435-253.300.
Horinishi, Nobutaka: *See—*
Matsunaga, Akira; Wakatsuki, Junya; Horinishi, Nobutaka; Imamura, Takashi; and Kurosaki, Tomihiro, 4,985,412, Cl. 514-70.000.
Horisonscan Inc.: *See—*
Smith, Graham T., 4,985,762, Cl. 358-87.000.
Horiuchi, Naoya: *See—*
Furuya, Nobuaki; Ono, Takuhiro; Horiuchi, Naoya; Yamanaka, Keiichro; and Miyata, Takeo, 4,985,898, Cl. 372-106.000.
Horiuchi, Yukio: *See—*
Ryu, Shiro; Mochizuki, Kiyohumi; and Horiuchi, Yukio, 4,984,884, Cl. 356-73.100.
Horiuti, Masao; Kodama, Shunichi; and Kuroda, Kenji, to Anritsu Corporation. Ultra-black film and method of manufacturing the same. 4,984,855, Cl. 350-1.100.
Horodysky, Andrew G.: *See—*
Farng, Liehpao O.; Horodysky, Andrew G.; Ernhoffer, Robert E.; and Keller, John A., Jr., 4,985,157, Cl. 252-49.600.
Horstman, Robert E., to U.S. Philips Corporation. Inspection apparatus incorporating digital electron detection. 4,985,628, Cl. 250-310.000.
Hosaka, Yasuo; and Ohno, Tadayoshi, to Kabushiki Kaisha Toshiba. Apparatus for generating ions using low signal voltage. 4,985,716, Cl. 346-159.000.
Hoshi, Hideo. Multistage cylinder actuator. 4,984,509, Cl. 92-107.000.
Hoshi, Masakazu: *See—*
Watanabe, Etsuo; and Hoshi, Masakazu, 4,985,125, Cl. 204-153.120.
Hoshi, Satoshi: *See—*
Kitatani, Katsuji; Makino, Naonori; Hoshi, Satoshi; Sato, Hideo; and Ohno, Shigeru, 4,985,324, Cl. 430-56.000.
Hoshida, Shigehiro: *See—*
Amano, Tadashi; and Hoshida, Shigehiro, 4,985,524, Cl. 526-344.200.
Hoshino, Kazuhiro, to Fujitsu Limited. Semiconductor device using copper metallization. 4,985,750, Cl. 357-71.000.
Hoshino, Masahiko. Laser apparatus for medical treatment. 4,985,029, Cl. 606-16.000.

Hoshino, Takaya: *See*—
Motoe, Hisafumi; Tokuhara, Masaharu; and Hoshino, Takaya, 4,985,701, Cl. 341-61.000.
Hosiden Electronics Co., Ltd.: *See*—
Yamamoto, Akira, 4,984,994, Cl. 439-267.000.
Hosokami, Toru: *See*—
Miki, Tosaku; Asano, Masahide; and Hosokami, Toru, 4,985,595, Cl. 564-157.000.
Hosokawa, Toshio: *See*—
Iizuka, Yo; Kashiwadate, Ken; Hosokawa, Toshio; Endo, Shunzo; Katto, Takayuki; Mizuno, Toshiya; and Katase, Kenichi, 4,985,512, Cl. 525-537.000.
Hosoki, Yoshinori: *See*—
Kitahara, Koichi; Natsume, Yoshinori; and Hosoki, Yoshinori, 4,985,745, Cl. 357-49.000.
Hosoya, Ikuo: *See*—
Ito, Toshimichi; Nosaka, Masaaki; and Hosoya, Ikuo, 4,984,534, Cl. 118-723.000.
Ito, Toshimichi; Nosaka, Masaaki; and Hosoya, Ikuo, 4,985,227, Cl. 423-446.000.
Hou, Jack. Apparatus for imparting sound and movement to an ornament. 4,985,883, Cl. 369-69.000.
Houston, Theodore W., to Texas Instruments Incorporated. Asymmetrical delay for controlling word line selection. 4,985,865, Cl. 365-194.000.
Howard, Robert G.; and Zivi, Edwin L., Jr., to United States of America, Navy. Multiple channel automatic concentration meter. 4,984,452, Cl. 73-61.300.
Howarth, Stuart B.: *See*—
Heywood, Derek W.; and Howarth, Stuart B., 4,985,040, Cl. 8-128.100.
Howell, John R.: *See*—
Peterson, John L.; and Howell, John R., 4,984,434, Cl. 62-94.000.
Hoxan Corporation: *See*—
Kuraoka, Yasuo; and Sakao, Nobuo, 4,984,430, Cl. 62-51.100.
Hoy, Thomas A.: *See*—
Scherer, Mark D.; and Hoy, Thomas A., 4,984,655, Cl. 182-204.000.
Hsu, Adam C.; and Aller, Harold E., to Rohm and Haas Company. Insecticidal N'-substituted-N,N'-diacylhydrazines. 4,985,461, Cl. 514-615.000.
Hsu, Li-Ling. Assembly of beverage bottle/can and cup. 4,984,723, Cl. 224-148.000.
Huang, Hua-Feng, to Du Pont de Nemours, E. I., and Company. Shrinkable, conformable microwave wrap. 4,985,300, Cl. 428-332.000.
Huang, Kuo-Liang. Diesel engine fuel pipeline heating device. 4,984,555, Cl. 123-545.000.
Hubbard, Lloyd C.: *See*—
Clausen, Earl W.; and Hubbard, Lloyd C., 4,984,972, Cl. 417-420.000.
Hucknall, Richard. Door holder including a removable cam. 4,984,331, Cl. 16-51.000.
Hudson, Earl K.; Martinez, Romulo M.; and Woodward, James R., to Rohr Industries, Inc. Method of superplastically forming and diffusion bonding a laminate assembly. 4,984,732, Cl. 228-173.200.
Hudson, Rex D.: *See*—
Jordan, Mitchell; Mercer, James C.; Straughan, Charles; and Hudson, Rex D., 4,984,448, Cl. 73-40.50R.
Hudson, Sharon J., Jr., to Sharon Manufacturing Company. Fuel injector retainer clip. 4,984,548, Cl. 123-470.000.
Huels Aktiengesellschaft: *See*—
Balzer, Dieter; and Lueders, Harald, 4,985,154, Cl. 252-8.554.
Schueler, Ralf; Muegge, Joachim; Droescher, Michael; Bartz, Wilfried; and Feinauer, Roland, 4,985,494, Cl. 525-67.000.
Huff, Byron J. L.: *See*—
Vinson, Kenneth D.; and Huff, Byron J. L., 4,985,119, Cl. 162-149.000.
Hughes Aircraft Company: *See*—
Kelly, Kenneth C., 4,985,708, Cl. 343-771.000.
Moss, Gaylord E.; and Wreede, John E., 4,984,856, Cl. 350-3.670.
Hughes, Donald W. K.: *See*—
Duncan, Frank L.; Hughes, Donald W. K.; and Ward, Bobby G., 4,984,998, Cl. 439-352.000.
Hughes, John, to American Colloid Company. Plant transplant and plant preservation medium. 4,985,061, Cl. 71-68.000.
Hughes, John, to American Colloid Company. Method of improving crop yield. 4,985,062, Cl. 71-77.000.
Hughes, Leslie R.; Oldfield, John; and Pegg, Stephen J., to Imperial Chemical Industries plc; and National Research Development Corp. Anti-tumor agents. 4,985,441, Cl. 514-260.000.
Hughes Tool Company: *See*—
Isbell, Matthew R.; and Pessier, Rudolf C. O., 4,984,643, Cl. 175-341.000.
Huls AG: *See*—
Bollenrath, Franz-Michael; and Rigler, Josef K., 4,984,899, Cl. 366-302.000.
Hultgren, George W., to Lake Eyelet Manufacturing Company, Incorporated. Lipstick-type cosmetic case. 4,984,919, Cl. 401-78.000.
Hurst, James, to Finnigan Corporation. Transfer line for mass spectrometer apparatus. 4,985,625, Cl. 250-288.000.
Husby, Donald E.: *See*—
Atac, Robert; Fischler, Mark S.; and Husby, Donald E., 4,985,830, Cl. 364-200.000.
Husseiny, Abdo A.; Liang, Enju; and Rodriguez, Rodrigo. Reliable fuzzy fault tolerant controller. 4,985,824, Cl. 364-187.000.
Hutchinson: *See*—
Domer, Michel, 4,984,928, Cl. 403-228.000.
Huybrechts, Jozef T.; and Zimmt, Werner, to Du Pont de Nemours, E. I., and Company. Acid catalysts for low temperature cure of coating compositions. 4,985,591, Cl. 562-102.000.
Hwang, David; Lev-Ran, Arye; and Barseghian, Ken, deceased (by Barseghian, Iemma, legal representative), to Anheuser-Busch Companies, Inc. Glucose tolerance factor and method of making same. 4,985,439, Cl. 514-312.000.
Hwang, Wen C. Fording frames of an umbrella. 4,984,599, Cl. 135-25.00R.
Iacovangelo, Charles D., to General Electric Company. Autocatalytic electroless gold plating composition. 4,985,076, Cl. 106-1.260.
Ibrahim, Nader; and Sodano, Jeanette L., to Beecham Inc. Tripolyphosphate-containing anti-calculus toothpaste. 4,985,236, Cl. 424-52.000.
Ibrahim, Tuncel: *See*—
Baker, James A.; James, Stuart L.; Ibrahim, Tuncel; and Marriott, Christopher, 4,985,462, Cl. 514-623.000.
Ichijima, Seiji; and Mihayashi, Keiji, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,985,336, Cl. 430-223.000.
Ichikawa, Akira; Asakawa, Yoshiaki; Komatsu, Akio; and Oohira, Eiji, to Hitachi, Ltd. High efficiency voice coding system. 4,985,923, Cl. 381-38.000.
Ichikawa, Kenji; Tsukamoto, Noboru; Iida, Eishi; Yoshimura, Yuji; and Inoue, Junichi, to Shinagawa Refractories Co., Ltd. Carbon-containing refractory and a manufacturing method therefor. 4,985,378, Cl. 501-89.000.
Ichikawa, Rinjiro; and Hashimoto, Kenji, to Fujimori Kogyo Co., Ltd. Liquid crystal display panel incorporating an optical phase shifting substrate. 4,985,285, Cl. 428-1.000.
Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, to Mitytoyo Corporation. Diffraction-type optical encoder with improved detection signal insensitivity to optical grating gap variations. 4,985,623, Cl. 250-231.160.
Ichimatsu, Tsuneo: *See*—
Sunahara, Kazuo; Ichimatsu, Tsuneo; and Aoki, Yumiko, 4,985,376, Cl. 501-22.000.
Ichimura, Kiyoshi: *See*—
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,984,859, Cl. 350-96.240.
Ichinose, Hidetoshi: *See*—
Takemura, Tetsu; Ichinose, Hidetoshi; Ohkubo, Keisuke; Sugitani, Akihiko; and Okamoto, Toshiyuki, 4,985,275, Cl. 427-106.000.
Icore International, Inc.: *See*—
Tucker, Willy L.; and Arcoleo, Katherine M., 4,984,995, Cl. 439-321.000.
Ide, Hiroshi; Aida, Kikuo; and Iwae, Shingo, to Juki Corporation. Thread chain guiding device for overedge sewing machines. 4,984,526, Cl. 112-162.000.
Idel, Karsten-Josef: *See*—
Pakull, Ralf; Freitag, Dieter; Eckhardt, Volker; Idel, Karsten-Josef; and Westeppe, Uwe, 4,985,532, Cl. 528-190.000.
Idemitsu Kosan Co., Ltd.: *See*—
Sakamoto, Shuji, 4,985,326, Cl. 430-96.000.
Idemitsu Petrochemical Co., Ltd.: *See*—
Ito, Toshimichi; Nosaka, Masaaki; and Hosoya, Ikuo, 4,984,534, Cl. 118-723.000.
Idigkeit, Werner: *See*—
Kurr, Klaus; Eckel, Hans-Gerd; Seifert, Heinz; Idigkeit, Werner; and Barth, Armin, 4,984,777, Cl. 267-140.100.
Idogaki, Takaharu; Hayashi, Ikuo; Ishihara, Toshihisa; Inoue, Hideo; and Sugitani, Tatsuo, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Two-dimensional acceleration sensor. 4,984,463, Cl. 73-516.00R.
Ihara Chemical Industry Co., Ltd.: *See*—
Tokunaga, Yukio; Kaku, Koichiro; Kojima, Yoshiyuki; Maeno, Shinichiro; Sawai, Nobumitsu; and Saso, Yasuo, 4,985,432, Cl. 514-258.000.
Wada, Nobuhide; Saito, Yoshihiro; Kusano, Shoji; Toyokawa, Yasuhumi; Miyazawa, Takeshige; Kajiwara, Ikuo; and Takahashi, Satoru, 4,985,066, Cl. 71-92.000.
Ihara, Keita; Yohda, Hiroshi; Sawai, Eisuke; and Takahashi, Ken, to Matsushita Electric Industrial Co., Ltd. Magnetic head with a tape contacting surface having a metal filled channel therein. 4,985,796, Cl. 360-122.000.
Iida, Eishi: *See*—
Ichikawa, Kenji; Tsukamoto, Noboru; Iida, Eishi; Yoshimura, Yuji; and Inoue, Junichi, 4,985,378, Cl. 501-89.000.
Iida, Hajime; and Nakamura, Tadashi, to Takao Kinzoku Kogyo Co., Ltd. Welding equipment. 4,985,611, Cl. 219-87.000.
Iida, Saburo: *See*—
Utunomiya, Jiro; Iida, Saburo; Sibuya, Hitosi; Kusaba, Kazunori; and Narumi, Isao, 4,985,747, Cl. 357-68.000.
Iida, Yasunobu: *See*—
Furuya, Koichi; Nakashima, Hiroshi; Iida, Yasunobu; Takeuchi, Nobuyuki; and Nakamura, Masato, 4,985,312, Cl. 428-627.000.
Iijima, Mamoru: *See*—
Nakazato, Horoshi; Iijima, Mamoru; and Nakamura, Akihiro, 4,984,953, Cl. 414-331.000.
Iijima, Yasuo, to Kabushiki Kaisha Toshiba. Portable electronic apparatus having key data for limiting memory access. 4,985,615, Cl. 235-492.000.

Iimura, Haruo: *See*—
Takiguchi, Yasuyuki; Kanemoto, Akihiko; Yokoi, Kenya; Iimura, Haruo; Enomoto, Takamichi; and Kamoi, Sumio, 4,984,873, Cl. 350-337.000.
Iizuka, Shigeo; Nakamura, Hiroyuki; Kishi, Takao; and Endo, Syuzo, to Yoshino Kogyosho Co., Ltd. Makeup liquid container with applicator. 4,984,918, Cl. 401-4.000.
Iizuka, Shigeo, to Yoshino Kogyosho Co., Ltd. Liquid container. 4,984,922, Cl. 401-277.000.
Iizuka, Shoji: *See*—
Nakano, Masao; Mori, Keiichi; Hiraiwa, Yoshitaka; Iizuka, Shoji; Shima, Shozo; and Nakamura, Yukio, 4,984,904, Cl. 374-139.000.
Iizuka, Yo; Kashiwadate, Ken; Hosokawa, Toshio; Endo, Shunzo; Katto, Takayuki; Mizuno, Toshiya; and Katase, Kenichi, to Kureha Kagaku Kogyo K. K. High-lubricity film. 4,985,512, Cl. 525-537.000.
Ikari, Masanori; and Yajima, Noboru, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for controlling speed of working machine in the form of a construction machine. 4,984,956, Cl. 414-699.000.
Ikeda Bussan Co., Ltd.: *See*—
Sugiura, Takashi; Matsuura, Ichiro; Miyauchi, Fumio; and Chiyoshi, Toyoharu, 4,985,189, Cl. 264-26.000.
Ikeda, Fumiaki: *See*—
Nakayama, Shigenobu; and Ikeda, Fumiaki, 4,985,458, Cl. 514-533.000.
Ikeda, Hideo; and Ishimaru, Shingo, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,985,350, Cl. 430-567.000.
Ikeda, Kenji; Iwakura, Ken; and Takashima, Masanobu, to Fuji Photo Film Co., Ltd. Heat-sensitive recording material. 4,985,391, Cl. 503-208.000.
Ikeda, Shuji: *See*—
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,836, Cl. 364-426.020.
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,838, Cl. 364-426.020.
Ikeda, Takashi: *See*—
Kumagai, Yuugo; Tan, Ryouji; Ikeda, Takashi; Fujii, Tetsuya; Okada, Chiaki; Higashida, Osamu; Sugitani, Hatuo; and Fukasawa, Masato, 4,985,328, Cl. 430-110.000.
Ikejima, Satomi; and Iwata, Shigemi, to Mitsubishi Kenki Kabushiki Kaisha. Apparatus for controlling an elevator. 4,984,660, Cl. 187-134.000.
Ilardi, Leonora M.: *See*—
Madison, Stephen A.; Ilardi, Leonora M.; and Cerfontain, Hans, 4,985,561, Cl. 544-158.000.
Illinois Tool Works, Inc.: *See*—
Brunton, John S., 4,984,719, Cl. 222-454.000.
Imai, Akihiro: *See*—
Kawakami, Tetsuji; Imai, Akihiro; Taguchi, Nobuyoshi; Murata, Yukichi; and Hirota, Takao, 4,985,396, Cl. 503-227.000.
Matsuda, Hiromu; Taguchi, Nobuyoshi; Imai, Akihiro; and Yubakami, Keiichi, 4,985,399, Cl. 503-227.000.
Imai, Isao; Ishii, Toshitsugu; and Sueyoshi, Kouichi, to Toshiba Ceramics Co., Ltd. Process for making silicon nitride whisker. 4,985,224, Cl. 423-344.000.
Imai, Osamu: *See*—
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, 4,985,449, Cl. 514-349.000.
Imamura, Hirokatsu: *See*—
Umise, Shigeki; and Imamura, Hirokatsu, 4,985,292, Cl. 428-194.000.
Imamura, Masazumi: *See*—
Hayakawa, Isao; Atarashi, Shohgo; Imamura, Masazumi; Yokohama, Shuichi; Higashihashi, Nobuyuki; Sakano, Katsuichi; and Ohshima, Masayuki, 4,985,557, Cl. 540-598.000.
Imamura, Nobuaki: *See*—
Nakazumi, Akira; and Imamura, Nobuaki, 4,985,668, Cl. 318-568.200.
Imamura, Shigeyuki: *See*—
Takahashi, Mamoru; Imamura, Shigeyuki; and Takada, Masaki, 4,985,360, Cl. 435-189.000.
Imamura, Takashi: *See*—
Matsunaga, Akira; Wakatsuki, Junya; Horinishi, Nobutaka; Imamura, Takashi; and Kurosaki, Tomihiro, 4,985,412, Cl. 514-70.000.
Imamura, Tetsuichi, to Matsushita Electric Industrial Co., Ltd. Method of packaging electronic component parts using a eutectic die bonder. 4,984,731, Cl. 228-102.000.
Imanaka, Nobuhito: *See*—
Adachi, Ginya; Imanaka, Nobuhito; Aono, Hiromichi; Sugimoto, Eisuke; Sadaoka, Yoshihiko; Yasuda, Naoshi; Hara, Takeo; and Nagata, Masaki, 4,985,317, Cl. 429-191.000.
Imaoka, Koji: *See*—
Ataka, Kikuo; Imaoka, Koji; Yoshii, Kiyotaka; and Hirotsu, Kenji, 4,985,596, Cl. 564-258.000.
Imazu, Katsuhiro; Kobayashi, Tomomi; Ishinabe, Masao; and Iwamoto, Hisao, to Toyo Seikan Kaisha, Ltd. Redrawing method and drawn-redrawn can. 4,984,708, Cl. 220-660.000.
IMO Industries, Inc.: *See*—
Tobias, Reginald, 4,984,888, Cl. 356-328.000.
Imokawa, Genji: *See*—
Yano, Shinji; Kawamata, Akira; Minematsu, Yoshihiro; Akazaki, Shuichi; Zama, Mitsuko; Imokawa, Genji; Takaishi, Naotake; Ohtomo, Tsuyoshi; and Komori, Takashi, 4,985,547, Cl. 536-4.100.
Imperial Chemical Industries PLC: *See*—
Beck, Nicholas C.; Gemmell, Peter A.; and Hann, Richard A., 4,985,398, Cl. 503-227.000.
Butters, Alan; and Barker, Roger N., 4,985,301, Cl. 428-336.000.
Hughes, Leslie R.; Oldfield, John; and Pegg, Stephen J., 4,985,441, Cl. 514-260.000.
Lywood, Warwick J., 4,985,231, Cl. 423-652.000.
Imura, Hiroo: *See*—
Sawai, Kiichi; Takeda, Jun; Seino, Yutaka; Imura, Hiroo; Tanaka, Kenichi; Takahashi, Haruo; Mitani, Takahiko; and Kurono, Masayasu, 4,985,356, Cl. 435-69.400.
INA Walzlager Schaeffler KG: *See*—
Schmidt, Dieter; and Schuseil, Bolko, 4,985,009, Cl. 474-110.000.
Inada, Haruaki: *See*—
Suzuki, Kenichi; Inada, Haruaki; Kiue, Akira; and Sano, Tetsuro, 4,985,558, Cl. 546-256.000.
Inada, Toshio; Ueda, Aki; Mifune, Hironobu; and Ogura, Yukio, to Nicoh Company, Ltd. Parallel image processing system. 4,985,618, Cl. 250-208.100.
Inada, Yoriko: *See*—
Uchiyama, Hiromitsu; Kawamoto, Masayuki; and Inada, Yoriko, 4,984,820, Cl. 280-707.000.
Inagaki, Yoshihiro; Yamamoto, Hideo; and Mishimoto, Tetsuo, to Yamaha Corporation. Tone signal generation device having a tone element control function. 4,984,497, Cl. 84-626.000.
Incas International Carbon Solvent S.p.A.: *See*—
Sala, Guido; and Zucchiatti, Ivano, 4,985,302, Cl. 428-343.000.
Inch, John: *See*—
Pickerrell, Daniel A.; and Inch, John, 4,984,312, Cl. 4-378.000.
Indemitsu Petrochemical Co., Ltd.: *See*—
Ito, Toshimichi; Nosaka, Masaaki; and Hosoya, Ikuo, 4,985,227, Cl. 423-446.000.
Inertia Dynamics Corporation: *See*—
Hoffman, Ronald J., 4,984,669, Cl. 192-110.00R.
INfill Systems B. V.: *See*—
Habraken, Nicolaas J.; Van Randen, Age; De Vries, Franciscus; and De Jong, Fokke M., 4,984,408, Cl. 52-741.000.
Ingenieure Mayreder, Kraus & Co. Baugesellschaft m.b.H.: *See*—
Karpellus, Walter, 4,984,937, Cl. 405-260.000.
Ingoglia, Desiderata: *See*—
Moggi, Giovanni; Ingoglia, Desiderata; and Lenti, Daria, 4,985,282, Cl. 427-393.000.
Inokuti, Yukio; and Ito, Yoh, to Kawasaki Steel Corporation. Method of producing extra-low iron loss grain oriented silicon steel sheets. 4,985,635, Cl. 250-492.300.
Inomata, Kentaro: *See*—
Saito, Naohide; Shibuya, Shohei; and Inomata, Kentaro, 4,985,140, Cl. 208-347.000.
Inomata, Koichiro: *See*—
Sahashi, Masashi; Niu, Hiromi; and Inomata, Koichiro, 4,985,072, Cl. 75-246.000.
Inoue, Akira; and Horikoshi, Kouki, to Research Development Corporation. Microorganism capable of growing in 50% or more organic solvent. 4,985,363, Cl. 435-253.300.
Inoue, Hideo: *See*—
Idogaki, Takaharu; Hayashi, Ikuo; Ishihara, Toshihisa; Inoue, Hideo; and Sugitani, Tatsuo, 4,984,463, Cl. 73-516.00R.
Inoue, Hiroshi: *See*—
Murakami, Shinkichi; Watanabe, Osamu; Wada, Sadahisa; and Inoue, Hiroshi, 4,985,530, Cl. 528-103.000.
Inoue, Junichi: *See*—
Ichikawa, Kenji; Tsukamoto, Noboru; Iida, Eishi; Yoshimura, Yuji; and Inoue, Junichi, 4,985,378, Cl. 501-89.000.
Inoue, Kazuko: *See*—
Yoshida, Yoshio; Ogata, Nobuo; Ishii, Mitsuo; Kurata, Yukio; Nakata, Yasuo; Inoue, Takayuki; and Inoue, Kazuko, 4,985,880, Cl. 369-13.000.
Inoue, Masahiro: *See*—
Haruna, Kazuo; Ueda, Kanji; Inoue, Masahiro; and Someda, Hitosi, 4,985,052, Cl. 55-26.000.
Inoue, Shuji: *See*—
Yasumoto, Yoshio; Kageyama, Sadashi; Inoue, Shuji; Abe, Yoshio; and Uwabata, Hideyo, 4,985,769, Cl. 358-141.000.
Inoue, Takayuki: *See*—
Yoshida, Yoshio; Ogata, Nobuo; Ishii, Mitsuo; Kurata, Yukio; Nakata, Yasuo; Inoue, Takayuki; and Inoue, Kazuko, 4,985,880, Cl. 369-13.000.
Inoue, Yasushi: *See*—
Yohda, Hiroshi; and Inoue, Yasushi, 4,985,797, Cl. 360-126.000.
Inoue, Yoshifumi: *See*—
Shinohara, Toshio; and Inoue, Yoshifumi, 4,985,577, Cl. 556-445.000.
Inouye, Shigeharu: *See*—
Tsuruoka, Tsutomu; Nakabayashi, Satoru; Fukuyasu, Harumi; Ishii, Yuuko; Tsuruoka, Takashi; Yamamoto, Haruo; Inouye, Shigeharu; and Kondo, Shinichi, 4,985,445, Cl. 514-315.000.
Insight Concept Innovation & Invention Center: *See*—
Jacobssen, Patrick C., 4,985,232, Cl. 424-4.100.
Insley, Thomas I.: *See*—
Buckley, Lee A.; and Insley, Thomas I., 4,985,298, Cl. 428-288.000.
Institut Francais du Petrole: *See*—
Falcimaigne, Jean, 4,984,527, Cl. 114-264.000.
Renard, Pierre; Simandoux, Jean-Claude; and Burzynski, Jean-Pierre, 4,985,209, Cl. 422-140.000.

Rolland, Laurence; Bertoochio, Rene ; and Cheron, Jacques, 4,985,169, Cl. 252-69.000.

Institut Merieux: *See*—
Quentin-Millet, Marie-Jose B.; and Arminjon, Francois, 4,985,144, Cl. 210-198.200.

Institut National de la Sante et de La Recherche Medicale (INSERM): *See*—
Charpentier, Bruno; and Roques, Bernard P., 4,985,406, Cl. 514-11.000.

Institute Guilfoyle: *See*—
Seifert, William W., 4,984,381, Cl. 42-1.010.

Institute of Physical and Chemical Research, The: *See*—
Yoshioka, Hirosuke; Obata, Tokio; Fujii, Katsutoshi; Tsutsumiuchi, Kiyoshi; and Yoshiya, Haruo, 4,985,426, Cl. 514-241.000.

Intel Corporation: *See*—
Grochowski, Edward; and Gupta, Rajesh, 4,985,640, Cl. 307-269.000.

Intercontrole Societe Anonyme: *See*—
LeBourgeois, Luc, 4,984,627, Cl. 165-11.200.

Intergraph Corporation: *See*—
Gall, Winrich, 4,985,779, Cl. 358-298.000.

Internal Business Machine Corporation: *See*—
Findlay, Hugh T.; Froman, Kenneth H.; and Martone, James F., 4,984,912, Cl. 400-240.200.

International Business Machines Corp.: *See*—
Agarwala, Birendra N.; Beckman, Keith F.; Cooper-Joselow, Alice H.; Narayan, Chandrasekhar; Purushothaman, Sampath; and Ray, Sudipta K., 4,985,310, Cl. 428-620.000.
Aldrich, Gary R.; Brown, George T.; Millis, David B.; and Nowak, Ronald P., 4,985,855, Cl. 364-522.000.
Egitto, Frank D.; and Mlynko, Walter E., 4,985,112, Cl. 156-643.000.
Gutierrez, Santos F. A.; Baratoff, Alexis; and Pohl, Wolfgang D., 4,985,627, Cl. 250-306.000.

International Flavors & Fragrances Inc.: *See*—
Kang, Young C.; Tan, Chee-Teck; Byrne, Brian; Buckholz, Lawrence L., Jr; Sudol, Marion A.; and Boden, Richard M., 4,985,261, Cl. 426-243.000.
Narula, Anubhav P. S.; and De Virgilio John J., 4,985,402, Cl. 512-6.000.
Narula, Anubhav P. S.; Beck, Charles E. J.; and Hanna, Marie R., 4,985,403, Cl. 512-19.000.

International Fuel Cells Corporation: *See*—
Bose, Sudhangshu; and Gorman, Michael E., 4,985,316, Cl. 429-44.000.

Inukai, Ken-ichi: *See*—
Kushi, Kenji; Inukai, Ken-ichi; Iseki, Takayuki; and Fujimoto, Yasuyuki, 4,985,343, Cl. 430-285.000.

Inuyama, Toshihiko: *See*—
Kimizuka, Junichi; Inuyama, Toshihiko; Soya, Takashi; and Noguchi, Yasutaka, 4,985,896, Cl. 372-38.000.

Ioka, Mitsuo: *See*—
Iseki, Takeshi; Makino, Osamu; Ioka, Mitsuo; and Watanabe, Hirotoshi, 4,985,377, Cl. 501-51.000.

Iowa State University Research Foundation, Inc.: *See*—
Yeung, Edward S.; and Chen, Shun-Le, 4,984,857, Cl. 350-6.600.

Ippommatsu, Masamichi: *See*—
Okada, Osamu; Takami, Susumu; Kotani, Tamotu; Mori, Satoshi; Fujita, Hiroki; Fukumura, Naoko; and Ippommatsu, Masamichi, 4,985,074, Cl. 75-444.000.

Irca Industrie Ricerche Chimiche d'Albano S.p.A.: *See*—
Giobbio, Vincenzo; and Ambrosini, Leonardo, 4,985,549, Cl. 536-13.800.

Irie, Yoshio: *See*—
Kimura, Kazumasa; Hatsuda, Takumi; Irie, Yoshio; and Shimomura, Tadao, 4,985,514, Cl. 526-88.000.

Irube, Makoto; Nakajima, Junjiro; Umehara, Hajime; Tada, Nobuo; and Ajima, Masayoshi, to Hitachi, Ltd. Fuel spacer of separate cell type and manufacturing method therefor. 4,985,199, Cl. 376-442.000.

Irvin, Scot A.; Fedor, Robert A.; and Merritt, Carleton G., to Borden, Inc. Continuous extrusion for tortilla chip production. 4,985,269, Cl. 426-560.000.

Isbell, Matthew R.; and Pessier, Rudolf C. O., to Hughes Tool Company. Anti-balling earth boring bit. 4,984,643, Cl. 175-341.000.

Ise, Osao; Kanazawa, Hideto; and Ishida, Masahiko, to Taiho Industries Co., Ltd. Watercolor ink. 4,985,077, Cl. 106-22.000.

Iseki, Takayuki: *See*—
Kushi, Kenji; Inukai, Ken-ichi; Iseki, Takayuki; and Fujimoto, Yasuyuki, 4,985,343, Cl. 430-285.000.

Iseki, Takeshi; Makino, Osamu; Ioka, Mitsuo; and Watanabe, Hirotoshi, to Matsushita Electric Industrial Co., Ltd. Glaze resistor. 4,985,377, Cl. 501-51.000.

Ishibashi, Kenji: *See*—
Egawa, Takeshi; Nakai, Masaaki; Nakanishi, Yasuo; Ishimura, Toshihiko; Nishimura, Shinichi; Tsuji, Sadafusa; and Ishibashi, Kenji, 4,985,723, Cl. 354-400.000.

Ishibashi, Norio: *See*—
Okonogi, Shigeo; Tomita, Mamoru; Shimamura, Seiichi; Tomimura, Toshio; Ishibashi, Norio; Miyakawa, Hiroshi; and Sugawara, Koichi, 4,985,246, Cl. 424-115.000.

Ishibashi, Yasuo: *See*—
Kakimoto, Fumio; Asakawa, Naoki; Ishibashi, Yasuo; and Miyake, Yasuo, 4,985,245, Cl. 424-94.300.

Ishida, Akio: *See*—
Saito, Cyuichi; Ishida, Akio; Kaneko, Tatsuya; and Kimura, Toshihiko, 4,984,672, Cl. 198-333.000.

Ishida, Masahiko: *See*—
Ise, Osao; Kanazawa, Hideto; and Ishida, Masahiko, 4,985,077, Cl. 106-22.000.

Ishida, Masamitsu: *See*—
Higaski, Nobuaki; Ishida, Masamitsu; and Nakajima, Nobuyoshi, 4,985,630, Cl. 250-327.200.

Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, to Minolta Camera Kabushiki Kaisha. Image sensing device having direct drainage of unwanted charges. 4,985,774, Cl. 358-213.190.

Ishiguro, Masaji; Iwata, Hiromitsu; Nakatsuka, Takashi; Nakayama, Kiyoharu; Miyahara, Osamu; and Noguchi, Kenichi, to Suntory Limited; and Nippon Soda Co., Ltd. Process for preparing optically active tetrahydro-2-furoic acid. 4,985,575, Cl. 549-484.000.

Ishihara, Heigo; Osaki, Akira; Nagashiro, Waichi; and Maeda, Fuzio, to Hitachi, Ltd. Magnetic recording medium and method for producing the same. 4,985,295, Cl. 428-213.000.

Ishihara, Koji: *See*—
Nishino, Atsushi; Kimura, Kunio; Takeuchi, Yasuhiro; and Ishihara, Koji, 4,985,291, Cl. 428-116.000.

Ishihara, Kouichiro: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 4,984,575, Cl. 128-660.030.

Ishihara Sangyo Kaisha Ltd.: *See*—
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, 4,985,449, Cl. 514-349.000.

Ishihara, Toshihisa: *See*—
Idogaki, Takaharu; Hayashi, Ikuo; Ishihara, Toshihisa; Inoue, Hideo; and Sugitani, Tatsuo, 4,984,463, Cl. 73-516.00R.

Ishii, Akira; Yamakawa, Masahiro; and Toyomaki, Yoshio, to Nippon Zoki Pharmaceutical Co., Ltd. Parabanic acid derivatives and pharmaceutical compositions thereof. 4,985,453, Cl. 514-386.000.

Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Ishii, Kazuhiro, to Mitsubishi Rayon Company, Ltd. Process for the preparation of unsaturated carboxylic acids. 4,985,592, Cl. 562-534.000.

Ishii, Hitoshi: *See*—
Mori, Kazuhiko; Ishii, Hitoshi; and Miyawaki, Toshi, 4,985,087, Cl. 148-273.000.

Ishii, Kazuhiro: *See*—
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Ishii, Kazuhiro, 4,985,592, Cl. 562-534.000.

Ishii, Kozo: *See*—
Fujiwara, Takuji; Yoshimura, Hiroshi; Ishii, Kozo; and Takemoto, Kazuo, 4,984,484, Cl. 74-866.000.

Ishii, Masao: *See*—
Nishikawa, Makoto; Takamatsu, Hideo; Ishii, Masao; and Minatono, Shobu, 4,985,499, Cl. 525-89.000.

Ishii, Mitsuaki: *See*—
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,984,552, Cl. 123-492.000.

Ishii, Mitsuo: *See*—
Yoshida, Yoshio; Ogata, Nobuo; Ishii, Mitsuo; Kurata, Yukio; Nakata, Yasuo; Inoue, Takayuki; and Inoue, Kazuko, 4,985,880, Cl. 369-13.000.

Ishii, Tatsuya; Okumura, Yoshinori; and Nagatomo, Masao, to Mitsubishi Denki Kabushiki Kaisha. Method for making semiconductor device with no stress generated at the trench corner portion. 4,985,368, Cl. 437-038.000.

Ishii, Tohru; Asahi, Koichi; and Yamaguchi, Masahisa, to Dai Nippon Insatsu Kabushiki Kaisha. Label having sublimation transferred image. 4,984,823, Cl. 283-81.000.

Ishii, Toshikazu; and Sako, Norimitsu, to Kawasaki Steel Corporation. Semiconductor memory circuit. 4,985,867, Cl. 365-221.000.

Ishii, Toshitsugu: *See*—
Imai, Isao; Ishii, Toshitsugu; and Sueyoshi, Kouichi, 4,985,224, Cl. 423-344.000.

Ishii, Yuuko: *See*—
Tsuruoka, Tsutomu; Nakabayashi, Satoru; Fukuyasu, Harumi; Ishii, Yuuko; Tsuruoka, Takashi; Yamamoto, Haruo; Inouye, Shigeharu; and Kondo, Shinichi, 4,985,445, Cl. 514-315.000.

Ishijima, Toshiyuki, to NEC Corporation. Semiconductor memory device of one transistor-one capacitor memory cell type. 4,985,718, Cl. 357-23.600.

Ishikawa, Sueyoshi: *See*—
Tohzuka, Takashi; Kataoka, Yoshiaki; Ishikawa, Sueyoshi; and Fujiwara, Koji, 4,985,161, Cl. 252-54.000.

Ishikawa, Takamichi; Nomura, Masumi; and Takeuchi, Masuho, to Asahi Glass Company Ltd. Method for molding a filler-containing polytetrafluoroethylene. 4,985,190, Cl. 264-122.000.

Ishikawa, Takatoshi: *See*—
Fujimoto, Hiroshi; Yagihara, Morio; and Ishikawa, Takatoshi, 4,985,347, Cl. 430-393.000.

Ishimaru, Shingo: *See*—
Ikeda, Hideo; and Ishimaru, Shingo, 4,985,350, Cl. 430-567.000.

Ishimura, Toshihiko: *See*—
Egawa, Takeshi; Nakai, Masaaki; Nakanishi, Yasuo; Ishimura, Toshihiko; Nishimura, Shinichi; Tsuji, Sadafusa; and Ishibashi, Kenji, 4,985,723, Cl. 354-400.000.

Ishinabe, Masao: *See*—
Imazu, Katsuhiro; Kobayashi, Tomomi; Ishinabe, Masao; and Iwamoto, Hisao, 4,984,708, Cl. 220-660.000.

Ishio, Tadashi; and Matsumura, Daisuke, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing cross-linked laminated film. 4,985,188, Cl. 264-22.000.
Ishizaki, Naoki: *See*—
Karakama, Tadao; Ishizaki, Naoki; Takano, Toshiro; and Nunotani, Sadao, 4,984,603, Cl. 137-489.000.
Ishizawa, Hiroaki: *See*—
Uchida, Hiroyasu; Abe, Tetsuaki; and Ishizawa, Hiroaki, 4,984,628, Cl. 165-26.000.
Isner, Jeffrey M.; and Clarke, Richard, to Angeion Corporation. Catheter. 4,985,028, Cl. 606-15.000.
Isoda, Yoritaka, to Lintec Co., Ltd. Mass flowmeter. 4,984,460, Cl. 73-204.150.
Isover Saint-Gobain: *See*—
de Goys de Mezeyrac, Charles; Fugier, Roger; Giquel, Bernard; and Tetard, Serge, 4,985,482, Cl. 524-215.000.
Isozaki, Hideo; Mizutani, Tomoji; and Sakamoto, Yoshihiro, to Kohjin Co., Ltd. Process for preparing heat shrinkable polyethylene film. 4,985,197, Cl. 264-564.000.
Isozaki, Yasuhito: *See*—
Tabata, Munehiro; Hayashi, Chiharu; Isozaki, Yasuhito; Okano, Kazuyuki; and Hasegawa, Yo, 4,985,071, Cl. 75-246.000.
Isozumi, Shuzoo, to Mitsubishi Denki Kabushiki Kaisha. Support bearing for coaxial starter. 4,985,637, Cl. 290-48.000.
Isuzu Ceramics Research Institute Co., Ltd.: *See*—
Kawamura, Hideo, 4,984,541, Cl. 123-90.110.
Itaba, Tunesaku: *See*—
Wada, Yoshiaki; Itaba, Tunesaku; Kasahara, Koichiro; Mizuno, Tomokimi; and Momose, Yutaka, 4,984,812, Cl. 277-153.000.
Itameri-Kinter, Terry; and Sauerbrey, David W., to Tecumseh Products Company. Hermetic motor compressor unit having a hermetic terminal with electrically insulating anti-tracking cap. 4,984,973, Cl. 417-422.000.
Itatani, Ryohei: *See*—
Ooe, Takashi; Ogawa, Shinji; Miura, Akiko; and Itatani, Ryohei, 4,985,213, Cl. 422-186.010.
Ito, Hiroyasu: *See*—
Tokura, Norihito; Ito, Hiroyasu; and Okabe, Naoto, 4,985,743, Cl. 357-39.000.
Ito, Junki: *See*—
Kageyama, Naoki; Kuchiwaki, Hiroji; Ito, Junki; Sakuma, Nobumitsu; and Ogura, Yukio, 4,984,567, Cl. 128-660.020.
Ito, Masaru: *See*—
Saito, Atsushi; Ojima, Masahiro; and Ito, Masaru, 4,985,881, Cl. 369-13.000.
Ito, Masaya: *See*—
Kojima, Takio; and Ito, Masaya, 4,984,927, Cl. 403-30.000.
Ito, Masayoshi: *See*—
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,836, Cl. 364-426.020.
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,838, Cl. 364-426.020.
Ito, Setsuro: *See*—
Tanaka, Chikao; Ito, Setsuro; Nakao, Yasumasa; and Maeda, Kei, 4,985,375, Cl. 501-5.000.
Ito, Shinichiro: *See*—
Eguchi, Kazuhiro; Ochiai, Eiichi; Ito, Shinichiro; Yoneda, Takehiko; Taki, Hiromitsu; Noguchi, Toshiharu; Kiyosue, Kuniaki; Yoshida, Akiro; Sagawa, Morikazu; and Makimoto, Mitsuo, 4,985,690, Cl. 333-222.000.
Ito, Takanori, to Ricoh Company, Ltd. Method and apparatus for extracting black color component. 4,985,759, Cl. 358-79.000.
Ito, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaishi. High zoom-ratio/zoom lens system for use in a compact camera. 4,984,877, Cl. 350-423.000.
Ito, Toshimichi; Nosaka, Masaaki; and Hosoya, Ikuo, to Idemitsu Petrochemical Co., Ltd. Method for synthesis of diamond. 4,984,534, Cl. 118-723.000.
Ito, Toshimichi; Nosaka, Masaaki; and Hosoya, Ikuo, to Indemitsu Petrochemical Co., Ltd. Method for synthesis or diamond. 4,985,227, Cl. 423-446.000.
Ito, Yoh: *See*—
Inokuti, Yukio; and Ito, Yoh, 4,985,635, Cl. 250-492.300.
Itoh, Hiroshi: *See*—
Takada, Mitsuru; Itoh, Hiroshi; and Takahashi, Tokuyuki, 4,984,486, Cl. 74-868.000.
Iuchi, Shigeru: *See*—
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,984,859, Cl. 350-96.240.
Iwae, Shingo: *See*—
Ide, Hiroshi; Aida, Kikuo; and Iwae, Shingo, 4,984,526, Cl. 112-162.000.
Iwagaya, Takashi, to Fanuc Ltd. Tapping control system. 4,985,841, Cl. 364-474.330.
Iwahashi, Horoshi: *See*—
Kumagai, Shigeru; Iwahashi, Horoshi; and Nakai, Hiroto, 4,985,646, Cl. 307-448.000.
Iwakura, Ken: *See*—
Ikeda, Kenji; Iwakura, Ken; and Takashima, Masanobu, 4,985,391, Cl. 503-208.000.
Iwamoto, Hisao: *See*—
Imazu, Katsuhiro; Kobayashi, Tomomi; Ishinabe, Masao; and Iwamoto, Hisao, 4,984,708, Cl. 220-660.000.
Iwanaga, Shin-ichiro; Matsunaga, Tetsuaki; Nishiwaki, Ituo; and Enyo, Hiroji, to Japan Synthetic Rubber Co., Ltd. Conjugated diene copolymer, process for producing the same, and photosensitive resin composition comprising the same. 4,985,513, Cl. 526-80.000.
Iwasaki, Katsunori; Nozawa, Yasuto; and Tanigawa, Shigeho, to Hitachi Metals, Ltd. Method and apparatus for producing magnetically anisotropic Nd-Fe-B magnet material. 4,985,086, Cl. 148-101.000.
Iwasaki, Yasuo, to Fuji Xerox Co., Ltd. Automatic document conveying device for original in a two-sided copy machine. 4,984,779, Cl. 271-227.000.
Iwashita, Hiroyuki: *See*—
Orii, Makoto; and Iwashita, Hiroyuki, 4,984,666, Cl. 192-7.000.
Iwata, Hiromitsu: *See*—
Ishiguro, Masaji; Iwata, Hiromitsu; Nakatsuka, Takashi; Nakayama, Kiyoharu; Miyahara, Osamu; and Noguchi, Kenichi, 4,985,575, Cl. 549-484.000.
Iwata, Shigemi: *See*—
Ikejima, Satomi; and Iwata, Shigemi, 4,984,660, Cl. 187-134.000.
Iwata, Yoshifumi: *See*—
Naruse, Yoshihiro; Kato, Hideharu; and Iwata, Yoshifumi, 4,985,919, Cl. 380-18.000.
Iwatani, Shiro: *See*—
Kaneyuki, Kazutoshi; and Iwatani, Shiro, 4,985,670, Cl. 322-28.000.
Iwayanagi, Takao: *See*—
Uchino, Shoichi; Ueno, Takumi; Iwayanagi, Takao; Nonogaki, Saburo; and Hashimoto, Michiaki, 4,985,344, Cl. 430-325.000.
Izume, Takatomo; and Lalonde, Michael, to Kabushiki Kaisha Toshiba. Master computer controlled modular welder, weld control, and power unit apparatus and method. 4,985,612, Cl. 219-116.000.
Izumi, Zenichiro; Kurosawa, Shigeru; and Akiyoshi, Rika, to Showa Denko K.K. Thermoplastic elastomer. 4,985,502, Cl. 525-194.000.
Izzard, Martin J.: *See*—
Bee, Rodney D.; Evans, Ian D.; and Izzard, Martin J., 4,985,250, Cl. 424-401.000.
J. E. Ekornes A/S: *See*—
Ekornes, Jostein, 4,984,846, Cl. 297-317.000.
J. N. Fauver Company, Inc.: *See*—
Riley, Ron, 4,984,521, Cl. 104-290.000.
Jacober, Jeffrey M., to SGI Inc. Self supporting, selectively collapsible soft-walled carrier. 4,984,662, Cl. 190-107.000.
Jacobi, Gerald M., to Conair Corporation. Orthogonally asymmetric geometric hair rollers. 4,984,591, Cl. 132-229.000.
Jacobsen, Trond: *See*—
Klaveness, Jo; Jacobsen, Trond; and Lindberg, Bernt J., 4,985,233, Cl. 424-9.000.
Jacobssen, Patrick C., to Insight Concept Innovation & Invention Center. Gastric emptying kit. 4,985,232, Cl. 424-4.100.
Jagodzinski, John E.: *See*—
Voith, Donald J.; Paegelow, David G.; and Jagodzinski, John E., 4,984,629, Cl. 165-95.000.
Jakobsen, Palle: *See*—
Drejer, Jorgen; and Jakobsen, Palle, 4,985,446, Cl. 514-321.000.
James, Stuart L.: *See*—
Baker, James A.; James, Stuart L.; Ibrahim, Tuncel; and Marriott, Christopher, 4,985,462, Cl. 514-623.000.
Jameson, John W., to Leland Stanford Junior University, The Board of Trustees of the. Mechanical prehensor. 4,984,951, Cl. 414-1.000.
Jansen, Michael: *See*—
Botez, Dan; Jansen, Michael; Mawst, Luke J.; Peterson, Gary L.; Simmons, William W.; Wilcox, Jaroslava Z.; and Yang, Jane J. J., 4,985,897, Cl. 372-50.000.
Janula, Janusz: *See*—
Toczyski, Zygmunt; Kruczynski, Stanislaw W.; Frackiewicz, Henryk; Lozinski, Janusz; Chlopek, Zdzislaw; Danilczyk, Wiktor; Ranachowski, Jerzy; Janula, Janusz; and Wolski, Lech, 4,984,550, Cl. 123-478.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Adachi, Ginya; Imanaka, Nobuhito; Aono, Hiromichi; Sugimoto, Eisuke; Sadaoka, Yoshihiko; Yasuda, Naoshi; Hara, Takeo; and Nagata, Masaki, 4,985,317, Cl. 429-191.000.
Iwanaga, Shin-ichiro; Matsunaga, Tatsuaki; Nishiwaki, Ituo; and Enyo, Hiroji, 4,985,513, Cl. 526-80.000.
Jarvinen, Pekka, to Onninen Oy. Method for the formation of a transport unit. 4,984,962, Cl. 414-786.000.
Jawdoszyn, Claude, to Neiman. Automotive anti-theft sterring lock. 4,984,481, Cl. 74-577.00S.
Jensen, Brian D., to Caterpillar Inc. Linear impact ripper apparatus. 4,984,850, Cl. 299-37.000.
Jensen, Ernst J.: *See*—
Baden, Niels T.; Jensen, Ernst J.; and Larsen, Jorgen G., 4,985,230, Cl. 423-650.000.
Jensik, Charles J.; and Hanson, William P., to Piezo Crystal Company, Division of PPA Industries, Inc. Crystal header package. 4,985,655, Cl. 310-344.000.
Jentz, Bradley F.; and Yester, Francis R., to Motorola, Inc. Fully integrated digital FM discriminator. 4,985,684, Cl. 329-327.000.
Jerome, Manuel R., Jr.: *See*—
Llort, Francisco M.; and Jerome, Manuel R., Jr., 4,984,803, Cl. 273-235.00R.
Jervis B. Webb Company: *See*—
Dehne, Clarence A.; and Ellens, Daniel S., 4,984,523, Cl. 105-155.000.
Jessell, Thomas M.: *See*—
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Jidosha Kiki Co., Ltd.: *See*—
Suzuki, Haruo; and Satoh, Tohru, 4,984,507, Cl. 91-376.00R.
Jimenez, Antonio, to Mefina S.A. Device for cutting a textile filament. 4,984,727, Cl. 225-83.000.
John Wyeth & Brother, Limited: *See*—
Archibald, John L.; and Ward, Terence J., 4,985,438, Cl. 514-307.000.
Johnson, Bruce F.; and Mondello, Frank J., to General Electric Company. (1S-cis)-3-(4-hydroxyphenyl),5-cyclohexadiene-1,2-diol and corresponding acetate. 4,985,589, Cl. 560-130.000.
Johnson, Jack: *See*—
Ottman, Rick; Wiberg, Don; Johnson, Jack; Wanke, Thomas S.; and Davis, Thomas W., 4,984,989, Cl. 434-401.000.
Johnson, Noel H.: *See*—
Crowley, John L.; Kermani, Ahmad; Lassig, Stephan E.; Johnson, Noel H.; and Rickords, Gary R., 4,984,902, Cl. 374-1.000.
Johnson, Robert N.: *See*—
Merriam, Charles N.; Mallon, Charles B.; Harvey, James R.; and Johnson, Robert N., 4,985,314, Cl. 428-694.000.
Johnson, Sten E.: *See*—
Jonsson, Bjorn E. R.; Johnson, Sten E.; Kling, Lars-Orjan; and Avsan, Oleg, 4,985,826, Cl. 364-200.000.
Johnson, Terry S. Closure unit. 4,984,388, Cl. 49-501.000.
Johnson, William L.: *See*—
Mettler, John H.; Johnson, William L.; Strickland, William C.; and Zaderej, Victor V., 4,985,116, Cl. 156-656.000.
Johnston, Rex L. Flashlight carrying strap. 4,984,724, Cl. 224-257.000.
Jones, David L., to Styropack (UK) Limited. Container. 4,984,691, Cl. 206-506.000.
Jones, Stephen D.: *See*—
Williams, Alan; Wilson, John D.; Wragg, Roger D.; Jones, Stephen D.; Komodromos, Costa; and Reynolds, Timothy J., 4,985,385, Cl. 502-84.000.
Jonkers, Cornelius O. Belt conveyor with belt parts carried by a gas. 4,984,681, Cl. 198-811.000.
Jonsson, Bjorn E. R.; Johnson, Sten E.; Kling, Lars-Orjan; and Avsan, Oleg, to Telefonaktiebolaget L. M. Ericsson. Method and device to execute two instruction sequences in an order determined in advance. 4,985,826, Cl. 364-200.000.
Jordan, Joseph F., Jr. Shooters glove. 4,984,301, Cl. 2-161.00A.
Jordan, Mitchell; Mercer, James C.; Straughan, Charles; and Hudson, Rex D., to Atmos Energy Corporation. Leak detector and utilization pressure manifold. 4,984,448, Cl. 73-40.50R.
Josefsson, Leif E. B., to Flakt, Inc. Cleaning arrangement and method for paint spray booth. 4,984,595, Cl. 134-38.000.
Jouillat, Claude, to S.T.E.P. Dispenser for a liquid or a paste put under pressure by prior deformation of a resilient receptacle. 4,984,712, Cl. 222-95.000.
Joyal, George L., to George Enterprise Ltd. Under carriage sprayer for automobiles or the like. 4,984,746, Cl. 239-722.000.
Joyce, Robert H.: *See*—
Bajpai, Atul; Marczewski, Richard W.; Marek, Melissa M.; Shrivastava, Anil B.; Amble, Charles S.; Joyce, Robert H.; Kishore, Nanda; and Ollanik, Steven J., 4,985,857, Cl. 364-551.010.
Judco Manufacturing, Incorporated: *See*—
Valenzona, Joseph F., 4,985,605, Cl. 200-528.000.
Juki Corporation: *See*—
Ide, Hiroshi; Aida, Kikuo; and Iwae, Shingo, 4,984,526, Cl. 112-162.000.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Hollenstein, Helmut, 4,984,929, Cl. 403-230.000.
Julius, David J.; Axel, Richard; and Jessell, Thomas M., to Columbia University in the City of New York, The Trustees of. DNA encoding serotonin 1C (5HT1c) receptor, isolated 5HT1c receptor, mammalian cells expressing same and uses thereof. 4,985,352, Cl. 435-6.000.
Julius Glatz GmbH: *See*—
Riedesser, Walter, 4,984,589, Cl. 131-365.000.
Jung, Christophe; and Jung, Jean, to R. I. Ph. Recherche Informatique et Pharmacie (S.A.R.L.). Medication, dietetic product and hygienic product in the form of a powered composition obtained by adsorption of active ingredients on a rapidly dissolving sugar and process for obtaining said composition. 4,985,252, Cl. 424-439.000.
Jung, Fritz, to Allgemeine Baugesellschaft-A.Porr Aktiengesellschaft. Dry mortar mixture. 4,985,080, Cl. 106-672.000.
Jung, Harald: *See*—
Langen, Gunter; and Jung, Harald, 4,984,570, Cl. 128-156.000.
Jung, Jean: *See*—
Jung, Christophe; and Jung, Jean, 4,985,252, Cl. 424-439.000.
Junino, Alex: *See*—
Bugaut, Andree; and Junino, Alex, 4,985,042, Cl. 8-421.000.
K. C. Technical Services, Inc.: *See*—
Cosmo, Guy, 4,984,413, Cl. 53-465.000.
K.H.T. Know-How-Trading Patent Verwetung GmbH: *See*—
Stadlbauer, Wilhelm, deceased; Koch, Erwin; Zauner, Franz; Rinesch, Rudolf; and Vanovsek, Wolfgang, 4,985,067, Cl. 75-10.100.
Kabelmetal Electro: *See*—
Schippl, Klaus, 4,984,605, Cl. 138-149.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Goto, Hideki, 4,984,695, Cl. 212-231.000.
Kubomoto, Wataru, 4,984,427, Cl. 60-428.000.
Nakazumi, Akira; and Imamura, Nobuaki, 4,985,668, Cl. 318-568.200.
Takagi, Noboru; and Obata, Mitsuyoshi, 4,985,653, Cl. 310-88.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ikari, Masanori; and Yajima, Noboru, 4,984,956, Cl. 414-699.000.
Karakama, Tadao; Ishizaki, Naoki; Takano, Toshiro; and Nunotani, Sadao, 4,984,603, Cl. 137-489.000.
Kabushiki Kaisha Meidensha: *See*—
Mizushina, Fumio; Goto, Takashi; and Maruki, Toshimitsu, 4,984,988, Cl. 434-380.000.
Kabushiki Kaisha Riken: *See*—
Kurosawa, Hideyuki; Hirai, Toshio; Yamane, Hisanori; and Yamashita, Tsutomu, 4,985,117, Cl. 156-659.100.
Wada, Yoshiaki; Itaba, Tunesaku; Kasahara, Koichiro; Mizuno, Tomokimi; and Momose, Yutaka, 4,984,812, Cl. 277-153.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Komatsu, Fumito; and Hirasawa, Kenji, 4,985,790, Cl. 360-96.500.
Orii, Makoto; and Iwashita, Hiroyuki, 4,984,666, Cl. 192-7.000.
Shirotori, Yozo, 4,984,909, Cl. 384-493.000.
Kabushiki Kaisha SG: *See*—
Yamashita, Akira; and Teramoto, Katsumi, 4,985,822, Cl. 364-142.000.
Kabushiki Kaisha Toshiba: *See*—
Asahina, Hiroshi, 4,985,908, Cl. 378-99.000.
Hara, Kenji; and Wada, Yoshio, 4,985,685, Cl. 329-349.000.
Hosaka, Yasuo; and Ohno, Tadayoshi, 4,985,716, Cl. 346-159.000.
Iijima, Yasuo, 4,985,615, Cl. 235-492.000.
Izume, Takatomo; and Lalonde, Michael, 4,985,612, Cl. 219-116.000.
Kawakami, Takashi; and Kashima, Yasuhiro, 4,985,212, Cl. 422-179.000.
Kawano, Hisaaki; and Tanimoto, Yasufumi, 4,985,736, Cl. 355-311.000.
Kitahara, Koichi; Natsume, Yoshinori; and Hosoki, Yoshinori, 4,985,745, Cl. 357-49.000.
Kumagai, Shigeru; Iwahashi, Horoshi; and Nakai, Hiroto, 4,985,646, Cl. 307-448.000.
Maeda, Tomohisa; and Tsujita, Kazuhiko, 4,985,680, Cl. 324-322.000.
Matsumura, Kazuo; Nagata, Mitsuhiro; and Tanaka, Tadashi, 4,985,097, Cl. 156-87.000.
Matsuura, Hiroshi, 4,985,924, Cl. 381-43.000.
Nikaido, Masaru; Homma, Katsuhisa; and Kinoshita, Tadayoshi, 4,985,712, Cl. 346-76.0PH.
Obara, Tadashi, 4,984,692, Cl. 209-583.000.
Ohkawa, Kideki; Ozawa, Norio; and Matsubara, Motonari, 4,985,349, Cl. 430-495.000.
Okamura, Masami; and Sawa, Takao, 4,985,088, Cl. 148-305.000.
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Shimoda, Kenji; and Oosawa, Shin-ichi, 4,985,755, Cl. 358-22.000.
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Tojo, Toru; Kuwabara, Osamu; Kamiya, Masashi; and Yoshino, Hisakazu, 4,984,890, Cl. 356-356.000.
Tsuji, Hitoshi; Haraguchi, Hiroshi; Hirata, Osamu; and Hashimoto, Hidetsuna, 4,985,374, Cl. 437-229.000.
Yamamoto, Tomiaki; Murayama, Akio; Kondo, Susumu; Hato, Hitoshi; Kamagami, Shinichi; and Matsumoto, Shoichi, 4,984,874, Cl. 350-334.000.
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Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Akiyama, Shunichi; Sato, Norio; Suzuki, Kenichirou; Yoshimoto, Taisuke; and Nakasho, Hideaki, 4,985,211, Cl. 422-171.000.
Kabushiki Kaisha Yakult Honsha: *See*—
Ohshima, Yoshio; Watanabe, Tsunekazu; Watanabe, Keizaburo; Nonoyama, Noboru; Kitazume, Masayoshi; and Tomita, Yukihiro, 4,985,149, Cl. 210-603.000.
Kaczmarczyk, Edward T., to Deere & Company. Carrier frame for a quick coupler. 4,984,958, Cl. 414-723.000.
Kadin, Joseph: *See*—
Schmidt, Charles J.; Kadin, Joseph; and Poteat, S. Eugene, 4,985,707, Cl. 342-370.000.
Kadowaki, Yoshinobu; and Yoshii, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Microwave semiconductor switch. 4,985,689, Cl. 333-101.000.
Kaede, Hiroshi; Koike, Tadahiro; Kato, Shinji; Maeda, Yorishige; Fuwa, Yoshio; Sugimoto, Shigetoshi; Aoyagi, Hikaru; and Shibata, Shinzi, to Aichi Steel Works, Limited; and Toyota Jidosha Kabushiki Kaisha. Steel having good wear resistance. 4,985,092, Cl. 148-326.000.
Kaga, Takao: *See*—
Obitsu, Masamichi; Tomi, Isao; and Kaga, Takao, 4,985,229, Cl. 423-608.000.
Kageyama, Ken-ichi: *See*—
Yamada, Toshio; and Kageyama, Ken-ichi, 4,985,409, Cl. 514-46.000.
Kageyama, Naoki; Kuchiwaki, Hiroji; Ito, Junki; Sakuma, Nobumitsu; and Ogura, Yukio, to Hitachi Construction Machinery Co., Ltd.; and Kuchiwaki, Hiroji. Apparatus for measuring intracranial pressure. 4,984,567, Cl. 128-660.020.
Kageyama, Sadashi: *See*—
Yasumoto, Yoshio; Kageyama, Sadashi; Inoue, Shuji; Abe, Yoshio; and Uwabata, Hideyo, 4,985,769, Cl. 358-141.000.
Kageyama, Tetsuto: *See*—
Matsushima, Jun; Kageyama, Tetsuto; Nakamura, Shigekazu; and Wakazono, Kenji, 4,984,474, Cl. 73-862.330.
Kahlke, Robert J. Corner clamp assembly. 4,984,775, Cl. 269-41.000.

Kajiwara, Ikuo: *See*—
Wada, Nobuhide; Saito, Yoshihiro; Kusano, Shoji; Toyokawa, Yasuhumi; Miyazawa, Takeshige; Kajiwara, Ikuo; and Takahashi, Satoru, 4,985,066, Cl. 71-92.000.

Kakimoto, Fumio; Asakawa, Naoki; Ishibashi, Yasuo; and Miyake, Yasuo, to Eisai Co., Ltd. tPA-containing medical composition. 4,985,245, Cl. 424-94.300.

Kakinuma, Kazuo: *See*—
Yamamoto, Shosaku; and Kakinuma, Kazuo, 4,985,500, Cl. 525-123.000.

Kakizaki, Shinobu; Yamaoka, Fumiyuki; Kikushima, Shigeru; and Emura, Junichi, to Atsugi Motor Parts Company, Limited. Automotive suspension system and shock absorber therefor. 4,984,819, Cl. 280-707.000.

Kako, Hajime; and Kojima, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Fuel control apparatus for an internal combustion engine. 4,984,553, Cl. 123-494.000.

Kaku, Koichiro: *See*—
Tokunaga, Yukio; Kaku, Koichiro; Kojima, Yoshiyuki; Maeno, Shinichiro; Sawai, Nobumitsu; and Saso, Yasuo, 4,985,432, Cl. 514-258.000.

Kaku, Nobuyuki: *See*—
Kano, Kiyoshi; Kaku, Nobuyuki; Shigemura, Tatsuya; Tanaka, Yoshiyuki; Fukagawa, Yoshihiro; and Uesugi, Masaki, 4,985,788, Cl. 360-85.000.

Kakuchi, Junji: *See*—
Sugita, Norifumi; Niimura, Koichi; Oguchi, Yoshiharu; Hirose, Kunitaka; Matsunaga, Kenichi; Oohara, Minoru; Muto, Shigeaki; Kakuchi, Junji; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 4,985,543, Cl. 530-396.000.

Kakumaru, Hajime; Minami, Yoshitaka; Kubota, Naohiro; and Mashimo, Shinya, to Hitachi Chemical Co., Ltd.; and Adeka Argus Chemical Co., Ltd. Acridine compound and photopolymerizable composition using the same. 4,985,564, Cl. 546-104.000.

Kalami, Hoshmand: *See*—
Thomas, Alan D.; and Kalami, Hoshmand, 4,984,464, Cl. 73-517.00R.

Kalnins, William: *See*—
Peterson, Samuel F.; Hilger, Ronald O.; and Kalnins, William, 4,984,583, Cl. 128-66.000.

Kamagami, Shinichi: *See*—
Yamamoto, Tomiaki; Murayama, Akio; Kondo, Susumu; Hato, Hitoshi; Kamagami, Shinichi; and Matsumoto, Shoichi, 4,984,874, Cl. 350-334.000.

Kameda, Takashi: *See*—
Takahashi, Kunimasa; Kameda, Takashi; Yoshikawa, Masato; and Teranishi, Teruo, 4,985,184, Cl. 264-6.000.

Kameyama, Masao; and Kumagawa, Shigeyuki, to Mitsui Petrochemical Industries, Ltd. Thermosetting resin composition. 4,985,478, Cl. 523-219.000.

Kamezaki, Hisamitsu; and Tuburaya, Yoshitane, to Hitachi Maxell, Ltd. Optical data recording medium. 4,985,289, Cl. 428-64.000.

Kamimura, Haruo: *See*—
Saigo, Takeshi; Tokuya, Tomohiko; Kamimura, Haruo; Hori, Mitsuaki; and Yasuoka, Hidenori, 4,984,829, Cl. 285-334.000.

Kamins, Kathryn A.; and Statz, Robert J., to Du Pont de Nemours, E. I., and Company. Thermoplastic blends containing ethylene terpolymers and the preparation thereof. 4,985,497, Cl. 525-84.000.

Kamio, Kumimasa: *See*—
Saito, Yasuhisa; Kanagawa, Shuichi; Watanabe, Katsuya; and Kamio, Kumimasa, 4,985,529, Cl. 528-96.000.

Kamiya, Masashi: *See*—
Tojo, Toru; Kuwabara, Osamu; Kamiya, Masashi; and Yoshino, Hisakazu, 4,984,890, Cl. 356-356.000.

Kamoi, Sumio: *See*—
Takiguchi, Yasuyuki; Kanemoto, Akihiko; Yokoi, Kenya; Iimura, Haruo; Enomoto, Takamichi; and Kamoi, Sumio, 4,984,873, Cl. 350-337.000.

Kamono, Takashi: *See*—
Watanabe, Tetsuya; Sato, Yoshio; Nakamura, Tsutomu; Kumagai, Naoki; and Kamono, Takashi, 4,984,996, Cl. 439-326.000.

Kanagawa, Shuichi: *See*—
Saito, Yasuhisa; Kanagawa, Shuichi; Watanabe, Katsuya; and Kamio, Kumimasa, 4,985,529, Cl. 528-96.000.

Kanamori, Toshiya: *See*—
Osada, Noriyuki; Hisabe, Yasushi; Ohtani, Toshihiro; and Kanamori, Toshiya, 4,984,881, Cl. 350-616.000.

Kanaya, Junko: *See*—
Miura, Konoe; Ozawa, Tetsuo; and Kanaya, Junko, 4,985,171, Cl. 352-299.100.

Kanazawa, Hideto: *See*—
Ise, Osao; Kanazawa, Hideto; and Ishida, Masahiko, 4,985,077, Cl. 106-22.000.

Kanbara, Hajime: *See*—
Hata, Hajime; and Kanbara, Hajime, 4,985,222, Cl. 423-279.000.

Kanbara, Hisashige: *See*—
Ohta, Tomohisa; Hagiwara, Hiroyuki; Kanbara, Hisashige; Dobashi, Akihiko; and Seki, Yasuyuki, 4,985,471, Cl. 522-27.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Fujii, Sadao; Takase, Junji; and Kawai, Hideki, 4,985,531, Cl. 528-171.000.

Kaneko, Hisaharu: *See*—
Moriizumi, Shuichi; Masuhara, Kenichi; Yamabe, Hidetoshi; Tomosue, Takao; Mori, Kouji; and Kaneko, Hisaharu, 4,985,104, Cl. 156-244.110.

Kaneko, Tatsuya: *See*—
Saito, Cyuichi; Ishida, Akio; Kaneko, Tatsuya; and Kimura, Toshihiko, 4,984,672, Cl. 198-333.000.

Kaneko, Tomihioro: *See*—
Takahashi, Takehiko; Saito, Hideo; Watanabe, Takashi; and Kaneko, Tomihioro, 4,984,813, Cl. 280-30.000.

Kanemoto, Akihiko: *See*—
Takiguchi, Yasuyuki; Kanemoto, Akihiko; Yokoi, Kenya; Iimura, Haruo; Enomoto, Takamichi; and Kamoi, Sumio, 4,984,873, Cl. 350-337.000.

Kaneyama, Hideyo, to NEC Corporation. Analog multiplexer. 4,985,703, Cl. 341-141.000.

Kaneyasu, Masayoshi; and Kurihara, Nobuo, to Hitachi, Ltd. Control system for internal combustion engine. 4,984,545, Cl. 123-399.000.

Kaneyuki, Kazutoshi; and Iwatani, Shiro, to Mitsubishi Denki Kabushiki Kaisha. Voltage regulator for AC generator with two distinct output voltage. 4,985,670, Cl. 322-28.000.

Kang, Young C.; Tan, Chee-Teck; Byrne, Brian; Buckholz, Lawrence L., Jr; Sudol, Marion A.; and Boden, Richard M., to International Flavors & Fragrances Inc. Process for microwave browning proteinaceous fibrous meat products. 4,985,261, Cl. 426-243.000.

Kano, Kiyoshi; Kaku, Nobuyuki; Shigemura, Tatsuya; Tanaka, Yoshiyuki; Fukagawa, Yoshihiro; and Uesugi, Masaki, to Hitachi Video Engineering Inc.; and Hitachi, Ltd. Recording and reproducing apparatus. 4,985,788, Cl. 360-85.000.

Kano, Yoshinori: *See*—
Mohara, Masayuki; and Kano, Yoshinori, 4,984,354, Cl. 29-740.000.

Kanoh, Yoshiji: *See*—
Nakashima, Norihiko; Kanoh, Yoshiji; Suzuki, Atsushi; and Ueda, Sadashi, 4,985,390, Cl. 503-208.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Seyama, Fumio; Tsuchida, Tetsuo; and Kondo, Mitsuru, 4,985,393, Cl. 503-216.000.

Kao Corporation: *See*—
Kuwamoto, Hiroshi; Sakaguchi, Yoshihiro; Nagamori, Hiroyuki; and Nakagawa, Yasuhiro, 4,985,158, Cl. 252-49.300.
Matsunaga, Akira; Wakatsuki, Junya; Horinishi, Nobutaka; Imamura, Takashi; and Kurosaki, Tomihiro, 4,985,412, Cl. 514-70.000.
Nakashima, Norihiko; Kanoh, Yoshiji; Suzuki, Atsushi; and Ueda, Sadashi, 4,985,390, Cl. 503-208.000.
Tosaka, Masaki; Kawano, Haruki; and Deguchi, Katsuhiko, 4,985,177, Cl. 252-547.000.
Yahagi, Kazuyuki; and Suzuki, Toshio, 4,985,239, Cl. 424-70.000.
Yano, Shinji; Kawamata, Akira; Minematsu, Yoshihiro; Akazaki, Shuichi; Zama, Mitsuko; Imokawa, Genji; Takaishi, Naotake; Ohtomo, Tsuyoshi; and Komori, Takashi, 4,985,547, Cl. 536-4.100.

Karakama, Tadao; Ishizaki, Naoki; Takano, Toshiro; and Nunotani, Sadao, to Kabushiki Kaisha Komatsu Seisakusho. Flow control valve assembly. 4,984,603, Cl. 137-489.000.

Karaki, Takayuki: *See*—
Takahashi, Yoshinori; Misaki, Jun; and Karaki, Takayuki, 4,984,512, Cl. 99-327.000.

Karasawa, Wataru, to Tokyo Electron Limited. Method and apparatus of performing probing test for electrically and sequentially testing semiconductor device patterns. 4,985,676, Cl. 324-158.00R.

Karin, Jakob: *See*—
Landa, Benzion; Ezuz, Shabtai; Karin, Jakob; and Fenster, Paul, 4,985,732, Cl. 355-256.000.

Karl Otto Braun KG: *See*—
Langen, Gunter; and Jung, Harald, 4,984,570, Cl. 128-156.000.

Karpellus, Walter, to Ingenieure Mayreder, Kraus & Co. Baugesellschaft m.b.H. Rock bolt. 4,984,937, Cl. 405-260.000.

Karpisek, Ladislav S. Separable hinge connection. 4,984,333, Cl. 16-266.000.

Kasahara, Koichiro: *See*—
Wada, Yoshiaki; Itaba, Tunesaku; Kasahara, Koichiro; Mizuno, Tomokimi; and Momose, Yutaka, 4,984,812, Cl. 277-153.000.

Kasai, Masaaki; Yamazaki, Sakae; and Miyake, Sanae, to Terumo Kabushiki Kaisha. Blood collecting tube. 4,985,026, Cl. 604-403.000.

Kasanami, Tohru: *See*—
Watanabe, Shizuharu; Tani, Hiroji; and Kasanami, Tohru, 4,985,176, Cl. 252-521.000.

Kashima, Yasuhiro: *See*—
Kawakami, Takashi; and Kashima, Yasuhiro, 4,985,212, Cl. 422-179.000.

Kashiwabara, Kimito: *See*—
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,984,552, Cl. 123-492.000.

Kashiwadate, Ken: *See*—
Iizuka, Yo; Kashiwadate, Ken; Hosokawa, Toshio; Endo, Shunzo; Katto, Takayuki; Mizuno, Toshiya; and Katase, Kenichi, 4,985,512, Cl. 525-537.000.

Kashiwagi, Hiroshi: *See*—
Ohmure, Yukio; Kashiwagi, Hiroshi; Fujiwara, Katsuki; Tsuchiya, Tatsumi; and Aoyama, Hirokazu, 4,985,168, Cl. 252-67.000.

Kashiwazaki, Hiromi: *See*—
Saito, Muneo; Yamauchi, Yoshio; Kashiwazaki, Hiromi; Sugawara, Michiaki; and Hondo, Toshinobu, 4,984,602, Cl. 137-487.500.

Kastner, Klaus: *See*—
Leiber, Heinz; Ohnemuller, Hans; Kastner, Klaus; and Richter, Karl-Heinz, 4,984,649, Cl. 180-197.000.

Kasuya, Shiro. Needle cap for injector, guide for needle cap and grip for needle cap. 4,985,020, Cl. 604-192.000.

Kataoka, Hideaki; and Sashihara, Kenji, to Fuji Photo Film Co., Ltd. Self-processing film unit. 4,985,334, Cl. 430-207.000.
Kataoka, Hideaki: *See*—
Omote, Hiroki; and Kataoka, Hideaki, 4,985,335, Cl. 430-209.000.
Kataoka, Yoshiaki: *See*—
Tohzuka, Takashi; Kataoka, Yoshiaki; Ishikawa, Sueyoshi; and Fujiwara, Koji, 4,985,161, Cl. 252-54.000.
Katase, Kenichi: *See*—
Iizuka, Yo; Kashiwadate, Ken; Hosokawa, Toshio; Endo, Shunzo; Katto, Takayuki; Mizuno, Toshiya; and Katase, Kenichi, 4,985,512, Cl. 525-537.000.
Katayama, Hirohito: *See*—
Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, 4,985,444, Cl. 514-300.000.
Katayama, Hiroyuki: *See*—
Ohta, Kenji; Takahashi, Akira; Katayama, Hiroyuki; Hirokane, Junji; and Murakami, Yoshiteru, 4,985,885, Cl. 369-275.100.
Kato, Hideharu: *See*—
Naruse, Yoshihiro; Kato, Hideharu; and Iwata, Yoshifumi, 4,985,919, Cl. 380-18.000.
Kato, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Industrial robot. 4,984,959, Cl. 414-744.300.
Kato, Katuhisa: *See*—
Miyakawa, Naohisa; and Kato, Katuhisa, 4,984,839, Cl. 296-93.000.
Kato, Naoki; Tsukahara, Toshiro; Yanaura, Satoshi; and Haraga, Kousuke, to Mitsubishi Denki Kabushiki Kaisha. Rotary drum device having a head drive with positively bonded bobbin fixing members. 4,985,794, Cl. 360-107.000.
Kato, Noriaki: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,573, Cl. 549-402.000.
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,574, Cl. 549-402.000.
Kato, Shinichiro: *See*—
Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 4,984,826, Cl. 285-101.000.
Kato, Shinji: *See*—
Kaede, Hiroshi; Koike, Tadahiro; Kato, Shinji; Maeda, Yorishige; Fuwa, Yoshio; Sugimoto, Shigetoshi; Aoyagi, Hikaru; and Shibata, Shinzi, 4,985,092, Cl. 148-326.000.
Kato, Tadahiko, to Fuji Tekko Co., Ltd. Transfer apparatus for 4-wheel driving. 4,984,663, Cl. 192-0.02R.
Kato, Toshihiko: *See*—
Matuura, Hidekazu; Miyadera, Yasuo; and Kato, Toshihiko, 4,985,509, Cl. 525-426.000.
Katoh, Kazunobu: *See*—
Sakai, Minoru; Katoh, Kazunobu; Yamaguchi, Jiro; Okada, Hisashi; Yasuda, Tomokazu; and Satake, Masaki, 4,985,338, Cl. 430-264.000.
Katoh, Shigeru: *See*—
Yamada, Wataru; Kido, Yukio; Abe, Hiroyuki; Minami, Shunji; Katoh, Shigeru; and Yano, Junro, 4,985,878, Cl. 368-88.000.
Katoh, Shunsuke: *See*—
Hashimoto, Yoshihiro; Yamazaki, Shoji; and Katoh, Shunsuke, 4,985,672, Cl. 324-158.00R.
Katona, William: *See*—
Conroy, Walter J.; and Katona, William, 4,985,107, Cl. 156-299.000.
Katsuragawa, Seichi: *See*—
Koishi, Toshio; Ootani, Mikio; Katsuragawa, Seichi; and Sueta, Hideaki, 4,985,519, Cl. 526-249.000.
Katto, Takayuki: *See*—
Iizuka, Yo; Kashiwadate, Ken; Hosokawa, Toshio; Endo, Shunzo; Katto, Takayuki; Mizuno, Toshiya; and Katase, Kenichi, 4,985,512, Cl. 525-537.000.
Katz, Egon: *See*—
Grosch, Lothar; Zeidler, Falk; Katz, Egon; and Bossenmaier, Alban, 4,984,651, Cl. 180-268.000.
Katzer, Hans: *See*—
Kratel, Gunter; and Katzer, Hans, 4,985,163, Cl. 252-62.000.
Kaufman, Arie E.; and Bakalash, Reuven, to Research Foundation of State University of New York, The. Method and apparatus for storing, accessing, and processing voxel-based data. 4,985,856, Cl. 364-522.000.
Kaufmann, Bryan Environmental Concepts, Inc.: *See*—
Kaufmann, David A., 4,984,384, Cl. 47-9.000.
Kaufmann, David A., to Kaufmann, Bryan Environmental Concepts, Inc. Bio-degradable mulching material. 4,984,384, Cl. 47-9.000.
Kawabata, Kohji: *See*—
Takaya, Takao; Tozuka, Zenzaburo; Yasuda, Nobuyoshi; and Kawabata, Kohji, 4,985,555, Cl. 540-229.000.
Kawabe, Shigehisa; and Hirayama, Keiichi, to NEC Corporation. Special effect system for video signal. 4,985,756, Cl. 358-22.000.
Kawachiya, Sachiko: *See*—
Takeda, Haruo; Hananoi, Toshihiro; and Kawachiya, Sachiko, 4,985,930, Cl. 382-56.000.
Kawada, Shigeru, to NEC Corporation. CMOS transfer switch free from malfunction on noise signal. 4,985,647, Cl. 307-449.000.
Kawada, Yukihiro, to Fuji Photo Film Co., Ltd. Camera having a focus controller capable of focusing in horizontal and vertical directions of an image. 4,985,777, Cl. 358-227.000.
Kawaguchi, Katuhide: *See*—
Sasaki, Naoki; and Kawaguchi, Katuhide, 4,985,100, Cl. 156-110.100.
Kawaguchi, Takafumi: *See*—
Nagashima, Nobuyoshi; Matsumoto, Toshio; Yasuda, Shuhei; Kawaguchi, Takafumi; and Takeda, Makoto, 4,985,770, Cl. 358-152.000.
Kawahara, Hironobu: *See*—
Fujimoto, Kotaro; Tanaka, Yoshie; Kawahara, Hironobu; and Sato, Yoshiaki, 4,985,113, Cl. 156-643.000.
Kawahara, Hiroshi: *See*—
Koyama, Hiroshi; Kondo, Masami; and Kawahara, Hiroshi, 4,984,455, Cl. 73-118.100.
Kawai, Hideki: *See*—
Fujii, Sadao; Takase, Junji; and Kawai, Hideki, 4,985,531, Cl. 528-171.000.
Kawakami, Eigo: *See*—
Nose, Noriyuki; Nakajima, Toshiyuki; Kawakami, Eigo; Baba, Takeshi; Kushibiki, Nobuo; Matsugu, Masakazu; and Niwa, Yukichi, 4,985,186, Cl. 264-1.700.
Kawakami, Hiroshi: *See*—
Okudaira, Sadayuki; Kawakami, Hiroshi; Kure, Tokuo; Tsujimoto, Kazunori; and Tachi, Shinichi, 4,985,114, Cl. 156-643.000.
Kawakami, Takashi; and Kashima, Yasuhiro, to Kabushiki Kaisha Toshiba. Support apparatus for a ceramic honeycomb element. 4,985,212, Cl. 422-179.000.
Kawakami, Tetsuji; Imai, Akihiro; Taguchi, Nobuyoshi; Murata, Yukichi; and Hirota, Takao, to Matsushita Electric Industrial Co., Ltd; and Mitsubishi Kasei Corporation. Dye transfer type thermal printing sheets. 4,985,396, Cl. 503-227.000.
Kawakita, Hiroaki: *See*—
Samejima, Kazuo; Kawakita, Hiroaki; Togoshi, Yoshikazu; Matsuda, Yoshiaki; Sakatsuji, Takao; and Fulford, Colin, 4,984,420, Cl. 56-203.000.
Kawakubo, Hitoshi: *See*—
Toyomaki, Yoshio; Nishikawa, Katsumi; and Kawakubo, Hitoshi, 4,985,354, Cl. 435-13.000.
Kawamata, Akira: *See*—
Yano, Shinji; Kawamata, Akira; Minematsu, Yoshihiro; Akazaki, Shuichi; Zama, Mitsuko; Imokawa, Genji; Takaishi, Naotake; Ohtomo, Tsuyoshi; and Komori, Takashi, 4,985,547, Cl. 536-4.100.
Kawamoto, Masayuki: *See*—
Uchiyama, Hiromitsu; Kawamoto, Masayuki; and Inada, Yoriko, 4,984,820, Cl. 280-707.000.
Kawamura, Hideo, to Isuzu Ceramics Research Institute Co., Ltd. Valve stepping drive apparatus. 4,984,541, Cl. 123-90.110.
Kawano, Atsuhiro: *See*—
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,836, Cl. 364-426.020.
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,838, Cl. 364-426.020.
Kawano, Haruki: *See*—
Tosaka, Masaki; Kawano, Haruki; and Deguchi, Katsuhiko, 4,985,177, Cl. 252-547.000.
Kawano, Hisaaki; and Tanimoto, Yasufumi, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,985,736, Cl. 355-311.000.
Kawasaki, Masami: *See*—
Sampei, Keiichi; and Kawasaki, Masami, 4,984,419, Cl. 56-202.000.
Kawasaki Steel Corporation: *See*—
Inokuti, Yukio; and Ito, Yoh, 4,985,635, Cl. 250-492.300.
Ishii, Toshikazu; and Sako, Norimitsu, 4,985,867, Cl. 365-221.000.
Ogura, Kuniaki; Oota, Junichi; Abe, Teruyoshi; and Takajo, Shigeaki, 4,985,309, Cl. 428-570.000.
Kawashima, Hideaki: *See*—
Matsuno, Kazuhiro; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, 4,985,237, Cl. 424-59.000.
Kawashima, Ichiro: *See*—
Takiguchi, Yo; Tani, Tokio; Kawashima, Ichiro; Ohsumi, Jun; Furukawa, Hidehiko; and Ohmine, Toshinori, 4,985,361, Cl. 435-218.000.
Kawashima, Nobuhiro: *See*—
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizou, 4,985,362, Cl. 435-226.000.
Kawaso Electric Industrial Co., Ltd.: *See*—
Nakano, Masao; Mori, Keiichi; Hiraiwa, Yoshitaka; Iizuka, Shoji; Shima, Shozo; and Nakamura, Yukio, 4,984,904, Cl. 374-139.000.
Kazuo Achiwa: *See*—
Achiwa, Kazuo; and Takeda, Hideo, 4,985,567, Cl. 548-412.000.
Kedgwick Limited: *See*—
Batty, Denis, 4,984,438, Cl. 68-27.000.
Keep, Gerald T., to Eastman Kodak Company. Polymer blend for molded circuit boards and other selectively conductive molded devices. 4,985,293, Cl. 428-209.000.
Keifer, Siegfried: *See*—
Rademachers, Jakob; Wilhelm, Volker; Keifer, Siegfried; and Burow, Wilfried, 4,985,078, Cl. 106-419.000.
Keller, John A., Jr.: *See*—
Farng, Liehpao O.; Horodysky, Andrew G.; Ernhoffer, Robert E.; and Keller, John A., Jr., 4,985,157, Cl. 252-49.600.
Keller, Suzanne: *See*—
Freeman, David H.; Angeles, Rosalie M.; and Keller, Suzanne, 4,985,143, Cl. 210-198.200.

Kelly, David J.; and Kim, Dai W., to Scotfoam Corporation. Highly absorbent polyurethane foam. 4,985,467, Cl. 521-52.000.
Kelly, Donna. Leakage preventing baby bottle. 4,984,697, Cl. 215-11.100.
Kelly, Kenneth C., to Hughes Aircraft Company. Array antenna with slot radiators offset by inclination to eliminate grating lobes. 4,985,708, Cl. 343-771.000.
Kempermann, Theo: *See*—
Schubart, Rudiger; Pieroth, Manfred; and Kempermann, Theo, 4,985,305, Cl. 428-389.000.
Kenakkala, Timo: *See*—
Ahonen, Heikki; Kenakkala, Timo; and Kokkonen, Pertti, 4,985,081, Cl. 106-772.000.
Kenji Sakuma, Kenji: *See*—
Sakuma, Ken, 4,985,266, Cl. 426-438.000.
Kennametal Inc.: *See*—
Bryant, William A.; and Grab, George P., 4,984,940, Cl. 407-119.000.
Keppel, William; and Erickson, Kenneth R. Method and apparatus for identifying and alleviating semantic memory deficiencies. 4,984,578, Cl. 128-732.000.
Kermani, Ahmad: *See*—
Crowley, John L.; Kermani, Ahmad; Lassig, Stephan E.; Johnson, Noel H.; and Rickords, Gary R., 4,984,902, Cl. 374-1.000.
Kernforschungszenthrum Karlsruhe GmbH: *See*—
Haefele, Edelbert; and Kotter, Michael, 4,985,126, Cl. 204-153.140.
Kessler, Rudolf; Degen, Winfried; Oelkrug, Dieter; and Tubach, Martin, to Daimler-Benz AG. Method for determining the corrosion resistance of deep-drawable iron sheets for body parts of motor vehicles and apparatus for performing the method. 4,985,622, Cl. 250-226.000.
Ketelhohn, Karl F. G., to Chemcut Corporation. Process and apparatus for intermittent fluid application. 4,985,111, Cl. 156-640.000.
Kido, Yukio: *See*—
Yamada, Wataru; Kido, Yukio; Abe, Hiroyuki; Minami, Shunji; Katoh, Shigeru; and Yano, Junro, 4,985,878, Cl. 368-88.000.
Kievsky Injenerno-Stroitelny Institut: *See*—
Azamatov, Ramil A.; Zamitter, Mikhail N.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; and Smirnov, Igor G., 4,984,817, Cl. 280-680.000.
Kihira, Michiharu: *See*—
Nishio, Takeyoshi; Yamauchi, Shinichi; Arashiro, Yusuke; Ohno, Kenyu; Yokoyama, Masuzo; Nakano, Hiroshi; Ohmori, Hiroshi; Mayumi, Junji; and Kihira, Michiharu, 4,985,495, Cl. 525-68.000.
Kikuchi, Shiego; and Nakamura, Shinya, to Tokyo Electric Co., Ltd. Magnetic recording apparatus for positioning magnetic head to track on magnetic tape. 4,985,787, Cl. 360-78.020.
Kikushima, Shigeru: *See*—
Kakizaki, Shinobu; Yamaoka, Fumiyuki; Kikushima, Shigeru; and Emura, Junichi, 4,984,819, Cl. 280-707.000.
Kim, Dai W.: *See*—
Kelly, David J.; and Kim, Dai W., 4,985,467, Cl. 521-52.000.
Kim, Hyun G. Detachable automobile floor mat having a detachable footrest. 4,984,838, Cl. 296-75.000.
Kim, Jung B. Manufacturing solid fuel. 4,985,049, Cl. 44-629.000.
Kim, Sang N.; Kroiss, Alfred; and Methfessel, Heinz, to Gasomatic - Airbag International Ltd. Gas expansion type shock absorbing safety cloth for autocycle driver. 4,984,821, Cl. 280-728.000.
Kimata, Yoshihide: *See*—
Sugimori, Yoshio; Kimata, Yoshihide; Kurosaki, Tadao; and Urano, Joji, 4,985,771, Cl. 358-160.000.
Kimizuka, Junichi; Inuyama, Toshihiko; Soya, Takashi; and Noguchi, Yasutaka, to Canon Kabushiki Kaisha. Laser driving device. 4,985,896, Cl. 372-38.000.
Kimura, Hiromoto: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Unno, Ryoichi; Matsumoto, Yukiharu; Kimura, Hiromoto; Oka, Mitsuru; and Sawai, Kiichi, 4,985,569, Cl. 548-453.000.
Kimura, Ikuo, to Kyokuto Kaihatsu Kogyo Co., Ltd. Waste sterilizing and crushing apparatus. 4,984,748, Cl. 241-65.000.
Kimura, Kazumasa; Hatsuda, Takumi; Irie, Yoshio; and Shimomura, Tadao, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for production of water absorbent resin. 4,985,514, Cl. 526-88.000.
Kimura, Kunio: *See*—
Nishino, Atsushi; Kimura, Kunio; Takeuchi, Yasuhiro; and Ishihara, Koji, 4,985,291, Cl. 428-116.000.
Kimura, Naomasa; Nishiguchi, Masayuki; and Noguchi, Minoru, to Honda Giken Kogyo Kabushiki Kaisha. Method of mounting a mechanical quantity sensor element. 4,985,108, Cl. 156-272.400.
Kimura, Tetsuya: *See*—
Ohashi, Mitsuo; Awano, Katsuya; Tanaka, Toshio; and Kimura, Tetsuya, 4,985,585, Cl. 560-9.000.
Kimura, Toshihiko: *See*—
Saito, Cyuichi; Ishida, Akio; Kaneko, Tatsuya; and Kimura, Toshihiko, 4,984,672, Cl. 198-333.000.
Kindsvogel, Wayne R.: *See*—
Maraganore, John M.; and Kindsvogel, Wayne R., 4,985,541, Cl. 530-370.000.
King, Frederick M.; and Collins, Harry F., to Service Ideas, Inc. Food container stacking device. 4,984,690, Cl. 206-503.000.
Kinoshita, Tadayoshi: *See*—
Nikaido, Masaru; Homma, Katsuhisa; and Kinoshita, Tadayoshi, 4,985,712, Cl. 346-76.0PH.
Kipfmuller, Karl: *See*—
Melzer, Andreas; Naruhn, Markus; Kipfmuller, Karl; Reidenbach, H. D.; and Buess, Gerd, 4,985,030, Cl. 606-51.000.
Kirimoto, Atsushi: *See*—
Takatsuki, Toyohiko; Kirimoto, Atsushi; and Nanba, Toshiyuki, 4,984,611, Cl. 141-65.000.
Kirkpatrick, Steven J.: *See*—
Neilson, Diane H. R.; Work, Sara L. R.; Whaley, Edward L.; Kirkpatrick, Steven J.; and McCarthy, James P., 4,985,271, Cl. 426-595.000.
Kirksey, Kirby, to Du Pont de Nemours, E. I., and Company. Purification of hydrogen peroxide. 4,985,228, Cl. 423-584.000.
Kishi, Takao: *See*—
Iizuka, Shigeo; Nakamura, Hiroyuki; Kishi, Takao; and Endo, Syuzo, 4,984,918, Cl. 401-4.000.
Kishi, Yoshio: *See*—
Shigeta, Toshio; Kishi, Yoshio; Kohata, Toshihide; and Sakano, Makoto, 4,984,750, Cl. 242-58.100.
Kishida, Kazuo; Kitai, Kiyokazu; and Mohri, Masaaki, to Mitsubishi Rayon Company, Ltd. Thermoplastic resin composition. 4,985,496, Cl. 525-74.000.
Kishimoto, Manabu: *See*—
Seo, Iwao; Nakajima, Kenji; and Kishimoto, Manabu, 4,985,179, Cl. 252-587.000.
Kishino, Hiroko; Matsuo, Noritada; Takagaki, Tohei; Tsushima, Kazunori; Yano, Toshihiko; and Torisu, Yoko, to Sumitomo Chemical Company, Limited. Novel carboxylic acid esters, methods for producing them and insecticides and/or acaricides containing them as an active ingredient. 4,985,457, Cl. 514-531.000.
Kishita, Hirofumi; Yamaguchi, Kouichi; and Takago, Toshio, to Shin-Etsu Chemical Co., Ltd. Curable silicone composition. 4,985,526, Cl. 528-15.000.
Kishore, Nanda: *See*—
Bajpai, Atul; Marczewski, Richard W.; Marek, Melissa M.; Shrivastava, Anil B.; Amble, Charles S.; Joyce, Robert H.; Kishore, Nanda; and Ollanik, Steven J., 4,985,857, Cl. 364-551.010.
Kitahara, Koichi; Natsume, Yoshinori; and Hosoki, Yoshinori, to Kabushiki Kaisha Toshiba. Substrate structure for composite semiconductor device. 4,985,745, Cl. 357-49.000.
Kitai, Kiyokazu: *See*—
Kishida, Kazuo; Kitai, Kiyokazu; and Mohri, Masaaki, 4,985,496, Cl. 525-74.000.
Kitamura, Kozo; Saitoh, Takeshi; Ueki, Mitsuo; and Kobori, Keiichi, to Toshiba Tungaloy Co., Ltd. High strength nitrogen-containing cermet and process for preparation thereof. 4,985,070, Cl. 75-238.000.
Kitasato Institute, The: *See*—
Makino, Satoshi; Sasaki, Keiko; and Nakagawa, Masaharu, 4,985,244, Cl. 424-89.000.
Kitatani, Katsuji; Makino, Naonori; Hoshi, Satoshi; Sato, Hideo; and Ohno, Shigeru, to Fuji Photo Film Co., Ltd. Electrophotographic photoreceptor. 4,985,324, Cl. 430-56.000.
Kitazume, Masayoshi: *See*—
Ohshima, Yoshio; Watanabe, Tsunekazu; Watanabe, Keizaburo; Nonoyama, Noboru; Kitazume, Masayoshi; and Tomita, Yukihiro, 4,985,149, Cl. 210-603.000.
Kitson, Melanie; and Williams, Peter S., to British Petroleum Company, p.l.c., The; and BP Chemicals Limited. Catalyzed hydrogenation of carboxylic acids and their anhydrides to alcohols and/or esters. 4,985,572, Cl. 549-326.000.
Kiue, Akira: *See*—
Suzuki, Kenichi; Inada, Haruaki; Kiue, Akira; and Sano, Tetsuro, 4,985,558, Cl. 546-256.000.
Kiyohara, Shuchi: *See*—
Fujibayashi, Kazuo; Hayakawa, Shingo; and Kiyohara, Shuchi, 4,985,726, Cl. 354-432.000.
Kiyosue, Kuniaki: *See*—
Eguchi, Kazuhiro; Ochiai, Eiichi; Ito, Shinichiro; Yoneda, Takehiko; Taki, Hiromitsu; Noguchi, Toshiharu; Kiyosue, Kuniaki; Yoshida, Akiro; Sagawa, Morikazu; and Makimoto, Mitsuo, 4,985,690, Cl. 333-222.000.
Klaerner, Peter: *See*—
Bronstert, Klaus; Hoenl, Hans; Echte, Adolf; and Klaerner, Peter, 4,985,503, Cl. 525-193.000.
Klaren, Dick G., to Eskla B.V. Method for the start-up and shut-down of an installation for operating physical and/or chemical processes, and a system for this purpose. 4,984,624, Cl. 165-104.160.
Klaveness, Jo; Jacobsen, Trond; and Lindberg, Bernt J., to Nycomed /AS. A diagnostic agent containing a non-radioactive paramagnetic metal species in a macromolecular carrier. 4,985,233, Cl. 424-9.000.
Kligman, Albert M. Treatment of periodontoclasia with retinoic acid. 4,985,235, Cl. 424-49.000.
Kling, Lars-Orjan: *See*—
Jonsson, Bjorn E. R.; Johnson, Sten E.; Kling, Lars-Orjan; and Avsan, Oleg, 4,985,826, Cl. 364-200.000.
Klocke, Donald J.: *See*—
Chu, Pochen; Herbst, Joseph A.; Klocke, Donald J.; and Vartuli, James, 4,985,223, Cl. 423-328.000.
Klose, Sigmar; Erler, Klaus; Uhl, Wolfgang; and Bajer, Manfred, to Boehringer Mannheim GmbH. Device for carrying out a heterogeneous reaction. 4,985,204, Cl. 422-56.000.
Klug, David M.; and Merz, Vernon R., to Nestec S.A. Coating method for frozen confectionery products. 4,985,263, Cl. 426-302.000.
Knickerbocker, Michael G., to Calmar, Inc. Tamper indicating closure assembly. 4,984,700, Cl. 215-251.000.
Knoedler, Roy E.; Au, William G.; and Parker, Robert M., to Gerry Baby Products Company. Vehicle seat for a child. 4,984,845, Cl. 297-250.000.
Knol, Jan D.: *See*—
Bes, Richard F. T.; and Knol, Jan D., 4,985,187, Cl. 264-13.000.

Knox, John D.: *See*—
Pennington, Donald C., Jr.; and Knox, John D., 4,984,944, Cl. 408-223.000.

Knurr, Hans, to Knurr-Mechanik fur die Elektronik Aktiengesellschaft. Lock hook. 4,984,833, Cl. 292-96.000.

Knurr-Mechanik fur die Elektronik Aktiengesellschaft: *See*—
Knurr, Hans, 4,984,833, Cl. 292-96.000.

Kobayashi, Goro: *See*—
Yomogida, Toshihiko; Uchida, Akira; Kobayashi, Goro; and Nakamura, Hisanori, 4,985,886, Cl. 370-1.000.

Kobayashi, Kazuhiro: *See*—
Kurematsu, Masayuki; Koboshi, Shigeharu; Kobayashi, Kazuhiro; and Takabayashi, Naoki, 4,985,118, Cl. 159-47.300.

Kobayashi, Kunio: *See*—
Ochi, Koji; Harada, Masahide; and Kobayashi, Kunio, 4,984,519, Cl. 102-217.000.

Kobayashi, Masao: *See*—
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Ishii, Kazuhiro, 4,985,592, Cl. 562-534.000.

Kobayashi, Noboru, to Yamaha Hatsudoki Kabushiki Kaisha. Venting and drain arrangement for small watercraft. 4,984,528, Cl. 114-270.000.

Kobayashi, Nobuo; Yamamoto, Hisaomi; and Umehara, Kiyoshi, to Dainippon Ink and Chemicals, Inc. Flame retardant for wood and flame resistant wood. 4,985,307, Cl. 428-413.000.

Kobayashi, Shigeo, to Nippei Toyama Corporation. Grinding disc dressing apparatus. 4,984,390, Cl. 51-5.00D.

Kobayashi, Tomomi: *See*—
Imazu, Katsuhiro; Kobayashi, Tomomi; Ishinabe, Masao; and Iwamoto, Hisao, 4,984,708, Cl. 220-660.000.

Kobayashi, Toru: *See*—
Matsuno, Kazuhiro; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, 4,985,237, Cl. 424-59.000.

Kobayashi, Toshiyuki; Makita, Shigeru; and Ota, Hiroyuki, to Omron Tateisi Electronics Co. Color comparison device having a bulged insertion groove for holding a test stick in a flexed condition. 4,984,895, Cl. 356-423.000.

Kobayashi, Tsutomu: *See*—
Tamaru, Shinji; Kubo, Motonobu; Tanaka, Osamu; and Kobayashi, Tsutomu, 4,985,297, Cl. 428-260.000.

Kobori, Keiichi: *See*—
Kitamura, Kozo; Saitoh, Takeshi; Ueki, Mitsuo; and Kobori, Keiichi, 4,985,070, Cl. 75-238.000.

Koboshi, Shigeharu: *See*—
Kurematsu, Masayuki; Koboshi, Shigeharu; Kobayashi, Kazuhiro; and Takabayashi, Naoki, 4,985,118, Cl. 159-47.300.

Koch, Erwin: *See*—
Stadlbauer, Wilhelm, deceased; Koch, Erwin; Zauner, Franz; Rinesch, Rudolf; and Vanovsek, Wolfgang, 4,985,067, Cl. 75-10.100.

Kodama, Satoshi: *See*—
Ogata, Kentarou; Kodama, Satoshi; and Murate, Masashi, 4,985,283, Cl. 427-424.000.

Kodama, Shunichi: *See*—
Horiuti, Masao; Kodama, Shunichi; and Kuroda, Kenji, 4,984,855, Cl. 350-1.100.

Kodama, Yoshimi; and Tsuchida, Takefumi, to Sanyo Electric Co., Ltd. Signal recording-reproducing apparatus for use with cassette. 4,985,789, Cl. 360-85.000.

Kodera, Kaoru: *See*—
Hayakawa, Kunio; Furuya, Hiromi; Shimada, Hisanori; Nakata, Masahiro; Kodera, Kaoru; Oohara, Kouji; and Akagi, Nobuo, 4,985,345, Cl. 430-335.000.

Koerner, James E.: *See*—
Shepler, Peter R.; Gammon, Nathan A.; Hopkins, William M.; Koerner, James E.; and Schmaltx, Charles K., 4,984,616, Cl. 152-209.00A.

Koga, Toshio; Ohki, Junichi; Ohta, Mutsumi; and Kunihiro, Hideto, to NEC Corp.; and NEC Home Electronics Ltd. Reproduction system capable of reproducing a still image by interrupting a sequence of recorded signals. 4,985,782, Cl. 358-335.000.

Kohama, Takuji; Minagawa, Fumiyasu; Shinjo, Goro; and Maeda, Kazuyuki, to Sumitomo Chemical Company, Limited. Poison bait for control of noxious insects. 4,985,413, Cl. 514-79.000.

Kohara, Hidekatsu: *See*—
Tokutake, Nobuo; Takahashi, Koichi; Satoh, Yoshiyuki; Kohara, Hidekatsu; and Nakayama, Toshimasa, 4,985,333, Cl. 430-192.000.

Kohata, Toshihide: *See*—
Shigeta, Toshio; Kishi, Yoshio; Kohata, Toshihide; and Sakano, Makoto, 4,984,750, Cl. 242-58.100.

Kohjin Co., Ltd.: *See*—
Isozaki, Hideo; Mizutani, Tomoji; and Sakamoto, Yoshihiro, 4,985,197, Cl. 264-564.000.

Kohno, Yoshiaki; and Sakai, Norio, to Murata Manufacturing Co., Ltd. Method of manufacturing ceramic laminate. 4,985,098, Cl. 156-89.000.

Koike, Hideto: *See*—
Fukui, Tsutomu; Koike, Hideto; and Ayukai, Kemmi, 4,985,636, Cl. 250-559.000.

Koike, Tadahiro: *See*—
Kaede, Hiroshi; Koike, Tadahiro; Kato, Shinji; Maeda, Yorishige; Fuwa, Yoshio; Sugimoto, Shigetoshi; Aoyagi, Hikaru; and Shibata, Shinzi, 4,985,092, Cl. 148-326.000.

Koishi, Toshio; Ootani, Mikio; Katsuragawa, Seichi; and Sueta, Hideaki, to Central Glass Company, Limited. Fluorine-containing copolymer useful as paint vehicle. 4,985,519, Cl. 526-249.000.

Koizumi, Shigeo; and Hayakawa, Yoshihide, to Fuji Photo Film Co., Ltd. Light-sensitive material containing silver halide, reducing agent, polymerizable compound and a polymeric binder. 4,985,339, Cl. 430-270.000.

Kojima, Masahiro; Nishikawa, Seiichi; and Takahashi, Nobuaki, to Toyota Jidosha Kabushiki Kaisha. Apparatus and method for controlling automatic transmission for motor vehicle, with anti-squat shifting arrangement. 4,984,485, Cl. 74-866.000.

Kojima, Shinji: *See*—
Kako, Hajime; and Kojima, Shinji, 4,984,553, Cl. 123-494.000.

Kojima, Takio; and Ito, Masaya, to NGK Spark Plug Co., Ltd. Ceramic and metal joining structure. 4,984,927, Cl. 403-30.000.

Kojima, Yoshiyuki: *See*—
Tokunaga, Yukio; Kaku, Koichiro; Kojima, Yoshiyuki; Maeno, Shinichiro; Sawai, Nobumitsu; and Saso, Yasuo, 4,985,432, Cl. 514-258.000.

Kokkonen, Pertti: *See*—
Ahonen, Heikki; Kenakkala, Timo; and Kokkonen, Pertti, 4,985,081, Cl. 106-772.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Ryu, Shiro; Mochizuki, Kiyohumi; and Horiuchi, Yukio, 4,984,884, Cl. 356-73.100.

Kolber, Michael A.; and Meinking, Terri L. Retractable chair. 4,984,768, Cl. 257-16.000.

Kolbert, Melvin, to Grumman Aerospace Corporation. Signal and power transmission through a wall. 4,985,922, Cl. 380-59.000.

Kolbl, Geinz: *See*—
Hildebrand, Heinz; Zitzmann, Werner; Arlt, Dieter; and Kolbl, Geinz, 4,985,364, Cl. 435-254.000.

Komatsu, Akio: *See*—
Ichikawa, Akira; Asakawa, Yoshiaki; Komatsu, Akio; and Oohira, Eiji, 4,985,923, Cl. 381-38.000.

Komatsu, Fumito; and Hirasawa, Kenji, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Mechanism for positioning a tape cartridge. 4,985,790, Cl. 360-96.500.

Komine, Hidemi; and Miyagi, Yoshio, to Amano Corporation. Time recorder having belt printing types. 4,985,713, Cl. 346-82.000.

Komodromos, Costa: *See*—
Williams, Alan; Wilson, John D.; Wragg, Roger D.; Jones, Stephen D.; Komodromos, Costa; and Reynolds, Timothy J., 4,985,385, Cl. 502-84.000.

Komori, Takashi: *See*—
Yano, Shinji; Kawamata, Akira; Minematsu, Yoshihiro; Akazaki, Shuichi; Zama, Mitsuko; Imokawa, Genji; Takaishi, Naotake; Ohtomo, Tsuyoshi; and Komori, Takashi, 4,985,547, Cl. 536-4.100.

Komuro, Akihiro: *See*—
Sakakura, Shigeki; and Komuro, Akihiro, 4,985,731, Cl. 355-210.000.

Kondo, Masami: *See*—
Koyama, Hiroshi; Kondo, Masami; and Kawahara, Hiroshi, 4,984,455, Cl. 73-118.100.

Kondo, Mitsuru: *See*—
Seyama, Fumio; Tsuchida, Tetsuo; and Kondo, Mitsuru, 4,985,393, Cl. 503-216.000.

Kondo, Noriyuki, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for measuring film thickness. 4,984,894, Cl. 356-382.000.

Kondo, Ryuji: *See*—
Murayama, Jin; and Kondo, Ryuji, 4,985,775, Cl. 358-213.130.

Kondo, Shinichi: *See*—
Tsuruoka, Tsutomu; Nakabayashi, Satoru; Fukuyasu, Harumi; Ishii, Yuuko; Tsuruoka, Takashi; Yamamoto, Haruo; Inouye, Shigeharu; and Kondo, Shinichi, 4,985,445, Cl. 514-315.000.

Kondo, Susumu: *See*—
Yamamoto, Tomiaki; Murayama, Akio; Kondo, Susumu; Hato, Hitoshi; Kamagami, Shinichi; and Matsumoto, Shoichi, 4,984,874, Cl. 350-334.000.

Kondo, Tadashi: *See*—
Sawaoka, Akira; Matsuda, Ryuichi; and Kondo, Tadashi, 4,985,401, Cl. 505-1.000.

Kondo, Yasuaki: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Unno, Ryoichi; Matsumoto, Yukiharu; Kimura, Hiromoto; Oka, Mitsuru; and Sawai, Kiichi, 4,985,569, Cl. 548-453.000.
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,573, Cl. 549-402.000.
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,574, Cl. 549-402.000.

Konechy, Kenneth A.: *See*—
Silverman, Stanley; Konechy, Kenneth A.; Van De Walker, Ray G.; and Newman, Richard S., 4,984,913, Cl. 400-249.000.

Konica Corporation: *See*—
Kurematsu, Masayuki; Koboshi, Shigeharu; Kobayashi, Kazuhiro; and Takabayashi, Naoki, 4,985,118, Cl. 159-47.300.
Sasa, Nobumasa; Shimizu, Kunio; Watanabe, Manabu; Urano, Toshiyuki; Mayama, Shinya; and Masuda, Tetsuya, 4,985,337, Cl. 430-254.000.

Konig, Helmut. Baking oven. 4,984,557, Cl. 126-21.00A.
Koninklijke Utermohlin N.V.: *See*—
Lommen, Etienne J. C. M. P.; Wildevuur, Charles R. H.; and Hinrigs, Wouter L. J., 4,985,036, Cl. 623-15.000.
Konishi, Jin-emon, to Nippon Zoki Pharmaceutical Co., Ltd. Method of treating ischemic diseases. 4,985,254, Cl. 424-520.000.
Konno, Kunio: *See*—
Sakagami, Hiroshi; Konno, Kunio; and Nonoyama, Meihan, 4,985,249, Cl. 424-195.100.
Koppens Automatic Fabrieken B.V.: *See*—
de la Haye, Cornelis F., 4,984,612, Cl. 141-198.000.
Korman, Charles S.: *See*—
Shenai, Krishna; Baliga, Bantval J.; Piacente, Patricia A.; and Korman, Charles S., 4,985,740, Cl. 357-23.400.
Korner, Michael: *See*—
Gotz, Eckart; Lerch, Hans-Reter; Dorsam, Thomas; Schweigert, Gerhard; Wittmann, Werner; and Korner, Michael, 4,985,845, Cl. 364-492.000.
Korsunsky, Iosif; Bateman, Steven P.; and Grabbe, Dimitry G., to AMP Incorporated. Locking clip for use with a chip carrier socket. 4,984,997, Cl. 439-331.000.
Koshi, Makoto: *See*—
Ohba, Hiroki; Koshi, Makoto; and Kumasaka, Norihiro, 4,985,730, Cl. 355-208.000.
Kotani, Genzaburou, to Mitsubishi Denki Kabushiki Kaisha. Digital locator. 4,985,843, Cl. 364-483.000.
Kotani, Tamotu: *See*—
Okada, Osamu; Takami, Susumu; Kotani, Tamotu; Mori, Satoshi; Fujita, Hiroki; Fukumura, Naoko; and Ippommatsu, Masamichi, 4,985,074, Cl. 75-444.000.
Kotani, Tomoyuki: *See*—
Utsumi, Shigeo; Kotani, Tomoyuki; and Tomitaka, Kichinojo, 4,985,537, Cl. 528-272.000.
Kotter, Michael: *See*—
Haefele, Edelbert; and Kotter, Michael, 4,985,126, Cl. 204-153.140.
Kouhia, Kenneth, to Summagraphics Corporation. Self-locking support for digitizer cover. 4,985,602, Cl. 178-18.000.
Kouken Co., Ltd.: *See*—
Matsumoto, Kesafumi, 4,984,623, Cl. 165-104.330.
Koumura, Noboru: *See*—
Ayata, Naoki; Sato, Yasushi; Saito, Seiji; Koumura, Noboru; and Fujii, Motoharu, 4,985,778, Cl. 358-296.000.
Kouno, Yoshiaki; and Sakai, Morio, to Murata Manufacturing Co., Ltd. Method of fabricating cylindrical ceramic laminated body. 4,985,103, Cl. 156-184.000.
Kovacic, Guido: *See*—
Hoffacker, Franz; Kovacic, Guido; and Luhrig, Hermann, 4,984,751, Cl. 242-74.000.
Koyama, Hiroshi; Kondo, Masami; and Kawahara, Hiroshi, to Diesel Kiki Co., Ltd. System for detecting speed of engine for vehicle. 4,984,455, Cl. 73-118.100.
Koyanagi, Toru: *See*—
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, 4,985,449, Cl. 514-349.000.
Kozachevsky, Gennady G.; Boikov, Vladimir P.; Guskov, Valery V.; Molodan, Oleg I.; Sizova, Svetlana I.; and Gorodnichev, Jury N. Mold for making annular polymeric articles. 4,984,976, Cl. 425-35.000.
Kozaki, Yoshihiro: *See*—
Sato, Takeaki; Kozaki, Yoshihiro; and Hirota, Kunio, 4,984,443, Cl. 72-67.000.
Kramer, Wolfgang; Weissmuller, Joachim; Berg, Dieter; Brandes, Wilhelm; and Dutzmann, Stefan, to Bayer Aktiengesellschaft. Fungicidal substituted dioxolanylethylamine. 4,985,421, Cl. 514-212.000.
Kratel, Gunter; and Katzer, Hans, to Consortium fur Elektrochemische Industrie GmbH. Shaped heat-insulating body and process of making the same. 4,985,163, Cl. 252-62.000.
Krause, Joachim: *See*—
Eidenschink, Rudolf; Krause, Joachim; Wachtler, Andreas; Hittich, Reinhard; Scheuble, Bernhard; Weber, Georg; and Kurmeier, Hans-Adolf, 4,985,583, Cl. 558-431.000.
Krauthamer, Martin. Window handle turning accessory. 4,984,489, Cl. 81-124.200.
Krebs, Andreas: *See*—
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 4,985,063, Cl. 71-88.000.
Kreidl, Janos; Turcsanyi, Peter; Arcs nee Trischler, Zsuzsanna; Stefko, Bela; Meszaros nee Brill, Judit M.; Deutsch nee Juhasz, Ida; Szilbereky, Jeno ; Csizer, Eva; and Vezer, Szilard, to Richter Gedeon Vegyeszeti Gyar Rt. Aminodiaryl sulfoxide derivatives, process for their preparation and pharmaceutical and pesticidal compositions containing them. 4,985,463, Cl. 514-646.000.
Kretzschmar, Gerhard: *See*—
Hamann, Peter; and Kretzschmar, Gerhard, 4,985,451, Cl. 514-382.000.
Kroiss, Alfred: *See*—
Kim, Sang N.; Kroiss, Alfred; and Methfessel, Heinz, 4,984,821, Cl. 280-728.000.
Kronenberger, Alban; and Bayer, Oswald, to FAG Kugelfischer Georg Schafer (KGaA). Pre-seal for magnetic liquid seal for an anti-friction bearing. 4,984,908, Cl. 384-478.000.
Kruczynski, Stanislaw W.: *See*—
Toczyski, Zygmunt; Kruczynski, Stanislaw W.; Frackiewicz, Henryk; Lozinski, Janusz; Chlopek, Zdzislaw; Danilczyk, Wiktor; Ranachowski, Jerzy; Janula, Janusz; and Wolski, Lech, 4,984,550, Cl. 123-478.000.
Krumhar, Kim C.: *See*—
Camire, Alexis L.; Ejike, Ofomata E.; Krumhar, Kim C.; and Taranto, Michael V., 4,985,262, Cl. 426-302.000.
Kubinec, James J., to Advanced Micro Devices, Inc. Two phase CMOS shift register bit for optimum power dissipation. 4,985,905, Cl. 377-79.000.
Kubis, Charles S.: *See*—
Pfaffmann, George D.; Kubis, Charles S.; Currie, John P.; Balzer, Norbert R.; Walter, John; and Adams, Graham R., 4,984,414, Cl. 53-478.000.
Kubo, Motonobu: *See*—
Tamaru, Shinji; Kubo, Motonobu; Tanaka, Osamu; and Kobayashi, Tsutomu, 4,985,297, Cl. 428-260.000.
Kubomoto, Wataru, to Kabushiki Kaisha Kobe Seiko Sho. Control circuit for hydraulic actuator. 4,984,427, Cl. 60-428.000.
Kubota, Ltd.: *See*—
Noguchi, Michio; Mori, Kazushige; Higashino, Nobuo; and Sunada, Motoki, 4,984,957, Cl. 414-723.000.
Samejima, Kazuo; Kawakita, Hiroaki; Togoshi, Yoshikazu; Matsuda, Yoshiaki; Sakatsuji, Takao; and Fulford, Colin, 4,984,420, Cl. 56-203.000.
Sampei, Keiichi; and Kawasaki, Masami, 4,984,419, Cl. 56-202.000.
Kubota, Naohiro: *See*—
Kakumaru, Hajime; Minami, Yoshitaka; Kubota, Naohiro; and Mashimo, Shinya, 4,985,564, Cl. 546-104.000.
Kubota, Tetsumaru: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 4,984,575, Cl. 128-660.030.
Kuchiwaki, Hiroji: *See*—
Kageyama, Naoki; Kuchiwaki, Hiroji; Ito, Junki; Sakuma, Nobumitsu; and Ogura, Yukio, 4,984,567, Cl. 128-660.020.
Kuester & Co.: *See*—
Marscholl, Klaus; and Medebach, Thomas, 4,984,386, Cl. 49-352.000.
Kuhls, Jurgen: *See*—
Herbrechtsmeier, Peter; Wieners, Gerhard; Kuhls, Jurgen; Tschacher, Manfred; and Fitz, Herbert, 4,984,870, Cl. 350-96.340.
Kuhn, Reinhard: *See*—
Buhler, Ulrich; Hahnke, Manfred; Kuhn, Reinhard; and Boos, Margarete, 4,985,043, Cl. 8-639.000.
Hahnke, Manfred; Kuhn, Reinhard; and Buhler, Ulrich, 4,985,044, Cl. 8-639.000.
Kuhn, Willi, to Brinckmann, Frank. Device for pivoting a motor-vehicle mirror from the normal position to a non-dazzle position. 4,985,667, Cl. 318-567.000.
Kumagai, Masahiro: *See*—
Matsumoto, Takeshi; Suzuki, Yuji; Kumagai, Masahiro; and Uchibori, Shinya, 4,985,288, Cl. 428-40.000.
Kumagai, Naoki: *See*—
Watanabe, Tetsuya; Sato, Yoshio; Nakamura, Tsutomu; Kumagai, Naoki; and Kamono, Takashi, 4,984,996, Cl. 439-326.000.
Kumagai, Shigeru; Iwahashi, Horoshi; and Nakai, Hiroto, to Kabushiki Kaisha Toshiba. Output buffer circuit of semiconductor integrated circuit. 4,985,646, Cl. 307-448.000.
Kumagai, Yuugo; Tan, Ryouji; Ikeda, Takashi; Fujii, Tetsuya; Okada, Chiaki; Higashida, Osamu; Sugitani, Hatuo; and Fukasawa, Masato, to Hitachi Chemical Co., Ltd. Dry toner, dry developer and process for forming electrophotographic images. 4,985,328, Cl. 430-110.000.
Kumagawa, Shigeyuki: *See*—
Kameyama, Masao; and Kumagawa, Shigeyuki, 4,985,478, Cl. 523-219.000.
Kumai, Seisaku; and Yokokouji, Osamu, to Asahi Glass Company Ltd. Nucleus-fluorinated aromatic carboxylates and processes for their production. 4,985,588, Cl. 560-103.000.
Kumasaka, Norihiro: *See*—
Ohba, Hiroki; Koshi, Makoto; and Kumasaka, Norihiro, 4,985,730, Cl. 355-208.000.
Kume, Shouji: *See*—
Azami, Kyoichiro; and Kume, Shouji, 4,985,322, Cl. 430-49.000.
Kumiai Chemical Industry Co., Ltd.: *See*—
Tokunaga, Yukio; Kaku, Koichiro; Kojima, Yoshiyuki; Maeno, Shinichiro; Sawai, Nobumitsu; and Saso, Yasuo, 4,985,432, Cl. 514-258.000.
Wada, Nobuhide; Saito, Yoshihiro; Kusano, Shoji; Toyokawa, Yasuhumi; Miyazawa, Takeshige; Kajiwara, Ikuo; and Takahashi, Satoru, 4,985,066, Cl. 71-92.000.
Kunihiro, Hideto: *See*—
Koga, Toshio; Ohki, Junichi; Ohta, Mutsumi; and Kunihiro, Hideto, 4,985,782, Cl. 358-335.000.
Kuraoka, Yasuo; and Sakao, Nobuo, to Hoxan Corporation. Method of fabricating frozen fine liver pieces for artificial liver, apparatus for freezing the same, and freezing vessel. 4,984,430, Cl. 62-51.100.
Kuraray Company Ltd.: *See*—
Nishikawa, Makoto; Takamatsu, Hideo; Ishii, Masao; and Minatono, Shobu, 4,985,499, Cl. 525-89.000.
Kurata, Yukio: *See*—
Yoshida, Yoshio; Ogata, Nobuo; Ishii, Mitsuo; Kurata, Yukio; Nakata, Yasuo; Inoue, Takayuki; and Inoue, Kazuko, 4,985,880, Cl. 369-13.000.

Kure, Tokuo: *See*—
Okudaira, Sadayuki; Kawakami, Hiroshi; Kure, Tokuo; Tsujimoto, Kazunori; and Tachi, Shinichi, 4,985,114, Cl. 156-643.000.

Kureha Kagaku Kogyo K. K.: *See*—
Iizuka, Yo; Kashiwadate, Ken; Hosokawa, Toshio; Endo, Shunzo; Katto, Takayuki; Mizuno, Toshiya; and Katase, Kenichi, 4,985,512, Cl. 525-537.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Sugita, Norifumi; Niimura, Koichi; Oguchi, Yoshiharu; Hirose, Kunitaka; Matsunaga, Kenichi; Oohara, Minoru; Muto, Shigeaki; Kakuchi, Junji; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 4,985,543, Cl. 530-396.000.

Kurematsu, Masayuki; Koboshi, Shigeharu; Kobayashi, Kazuhiro; and Takabayashi, Naoki, to Konica Corporation. Method for treating photographic process waste liquor through concentration by evaporation. 4,985,118, Cl. 159-47.300.

Kurihara, Nobuo: *See*—
Kaneyasu, Masayoshi; and Kurihara, Nobuo, 4,984,545, Cl. 123-399.000.

Kurisu, Norio: *See*—
Mori, Yasutomo; and Kurisu, Norio, 4,985,394, Cl. 503-226.000.

Kurita, Akitsugu; Takezawa, Yoshiaki; Saitoh, Nobuhiro; Shimada, Takehisa; and Takemoto, Hideaki, to Toshiba Silicone Co. Ltd.; and Asahi Breweries, Ltd. Abrasion-concealing agent for glass containers, abrasion-concealed glass container, and method for concealing abrasions on glass container. 4,985,286, Cl. 428-34.700.

Kurki, Jarmo, to Valmet-Ahlstrom, Inc. Method and apparatus for adjusting the cutting knife clearance in sheet cutters. 4,984,490, Cl. 83-13.000.

Kurkjian, Andrew L.: *See*—
Eyl, Kevin A.; Kurkjian, Andrew L.; Lineman, David J.; Pierce, Edward A.; and Steiner, Joseph M., Jr., 4,985,873, Cl. 367-27.000.

Kurmeier, Hans-Adolf: *See*—
Eidenschink, Rudolf; Krause, Joachim; Wachtler, Andreas; Hittich, Reinhard; Scheuble, Bernhard; Weber, Georg; and Kurmeier, Hans-Adolf, 4,985,583, Cl. 558-431.000.

Kuroda, Kazuhisa: *See*—
Fukui, Yoshiharu; and Kuroda, Kazuhisa, 4,985,480, Cl. 524-108.000.

Kuroda, Kenji: *See*—
Horiuti, Masao; Kodama, Shunichi; and Kuroda, Kenji, 4,984,855, Cl. 350-1.100.

Kuroda, Masafumi: *See*—
Ueno, Katsunori; Aiga, Masayuki; and Kuroda, Masafumi, 4,985,802, Cl. 361-302.000.

Kuroda, Masami; Sugata, Yoshinobu; and Furusho, Noboru, to Fuji Electric Co., Ltd. Photoconductor for electrophotography containing hydrazone. 4,985,325, Cl. 430-59.000.

Kuroda, Muneo, to Minolta Camera Kabushiki Kaisha. Light beam scanning optical system. 4,984,858, Cl. 350-6.800.

Kuroda, Nihee, to Fuso Pharmaceutical Industries, Ltd. Method and apparatus for blockading an opening through a cylindrical mouthpiece of a synthetic resin container. 4,984,415, Cl. 53-478.000.

Kuroda, Tomoyuki; and Fukuhara, Takahito, to TOA Medical Electronics Co., Ltd. Reticulocyte quantitating reagent for flow cytometry. 4,985,174, Cl. 252-408.100.

Kuroda, Toru; and Nishimura, Takao, to Asahi Medical Co., Ltd. Method for separating blood into blood components, and blood components separator unit. 4,985,153, Cl. 210-782.000.

Kurono, Masayasu; Kondo, Yasuaki; Unno, Ryoichi; Matsumoto, Yukiharu; Kimura, Hiromoto; Oka, Mitsuru; and Sawai, Kiichi, to Sanwa Kagaku Kenkyusho Co., Ltd. Pyrrolizine derivative and its manufacture. 4,985,569, Cl. 548-453.000.

Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, to Sanwa Kagaku Kenkyusho Co., Ltd. Hydantoin derivatives for treating complications of diabetes. 4,985,573, Cl. 549-402.000.

Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, to Sanwa Kagaku Kenkyusho Co., Ltd. Hydantoin derivatives for treating complications of diabetes. 4,985,574, Cl. 549-402.000.

Kurono, Masayasu: *See*—
Sawai, Kiichi; Takeda, Jun; Seino, Yutaka; Imura, Hiroo; Tanaka, Kenichi; Takahashi, Haruo; Mitani, Takahiko; and Kurono, Masayasu, 4,985,356, Cl. 435-69.400.

Kurosaki Refractories Co., Ltd.: *See*—
Nakano, Masao; Mori, Keiichi; Hiraiwa, Yoshitaka; Iizuka, Shoji; Shima, Shozo; and Nakamura, Yukio, 4,984,904, Cl. 374-139.000.

Kurosaki, Tadao: *See*—
Sugimori, Yoshio; Kimata, Yoshihide; Kurosaki, Tadao; and Urano, Joji, 4,985,771, Cl. 358-160.000.

Kurosaki, Tomihiro: *See*—
Matsunaga, Akira; Wakatsuki, Junya; Horinishi, Nobutaka; Imamura, Takashi; and Kurosaki, Tomihiro, 4,985,412, Cl. 514-70.000.

Kurosawa, Hideyuki; Hirai, Toshio; Yamane, Hisanori; and Yamashita, Tsutomu, to Kabushiki Kaisha Riken; and Research Development Corporation of Japan. Method of manufacturing josephson junctions. 4,985,117, Cl. 156-659.100.

Kurosawa, Shigeru: *See*—
Izumi, Zenichiro; Kurosawa, Shigeru; and Akiyoshi, Rika, 4,985,502, Cl. 525-194.000.

Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Tsuruoka, Ichiro; Takenouchi, Hiroaki; and Echigo, Katsuhiro, to Ricoh Company, Ltd. Image fixing unit for use in wet-type electrophographic copying machine. 4,985,733, Cl. 355-282.000.

Kuroyanagi, Kansuke: *See*—
Mizuhara, Noboru; and Kuroyanagi, Kansuke, 4,985,887, Cl. 370-58.200.

Kurr, Klaus; Eckel, Hans-Gerd; Seifert, Heinz; Idigkeit, Werner; and Barth, Armin, to Carl Freudenberg, Firma. Flexible bearing with a disk spring having an S-shaped spring constant curve. 4,984,777, Cl. 267-140.100.

Kurz, David W.: *See*—
Mathias, Lon J.; and Kurz, David W., 4,985,522, Cl. 526-288.000.

Kusaba, Kazunori: *See*—
Utunomiya, Jiro; Iida, Saburo; Sibuya, Hitosi; Kusaba, Kazunori; and Narumi, Isao, 4,985,747, Cl. 357-68.000.

Kusano, Shoji: *See*—
Wada, Nobuhide; Saito, Yoshihiro; Kusano, Shoji; Toyokawa, Yasuhumi; Miyazawa, Takeshige; Kajiwara, Ikuo; and Takahashi, Satoru, 4,985,066, Cl. 71-92.000.

Kushi, Kenji; Inukai, Ken-ichi; Iseki, Takayuki; and Fujimoto, Yasuyuki, to Mitsubishi Rayon Co., Ltd. Crosslinking-curable resin composition. 4,985,343, Cl. 430-285.000.

Kushibiki, Nobuo: *See*—
Nose, Noriyuki; Nakajima, Toshiyuki; Kawakami, Eigo; Baba, Takeshi; Kushibiki, Nobuo; Matsugu, Masakazu; and Niwa, Yukichi, 4,985,186, Cl. 264-1.700.

Kusumi, Hiroshi; Nozaki, Satoshi; and Yosida, Muneo, to Hitachi Construction Machinery Co., Ltd. Stopper apparatus for rotary reaction force: 4,984,936, Cl. 405-232.000.

Kutsuma, Masako: *See*—
Ono, Kohei; Satoh, Hitoshi; and Kutsuma, Masako, 4,985,852, Cl. 364-519.000.

Kuwabara, Osamu: *See*—
Tojo, Toru; Kuwabara, Osamu; Kamiya, Masashi; and Yoshino, Hisakazu, 4,984,890, Cl. 356-356.000.

Kuwabara, Tsuneo; and Miyazaki, Jingo, to Dover Japan, Inc. Pressure control system for stern tube seals. 4,984,811, Cl. 277-3.000.

Kuwamoto, Hiroshi; Sakaguchi, Yoshihiro; Nagamori, Hiroyuki; and Nakagawa, Yasuhiro, to Kao Corporation; and Nippon Kokan Kabushiki Kaisha. Lubricating oil composition and method for supplying same. 4,985,158, Cl. 252-49.300.

Kuwata, Masayoshi: *See*—
Waslo, Jennifer; Kuwata, Masayoshi; and Washam, Roy M., 4,984,429, Cl. 60-752.000.

KVR Manufacturing Corp.: *See*—
Springer, Jack F., Jr.; Smith, Timothy S.; Cloutier, Cathy A.; Marcantonio, Ben A.; and Willis, Richard A., 4,984,571, Cl. 128-371.000.

Kwok, Siang P., to Ford Microelectronics, Inc. Method for making self-aligned ohmic contacts. 4,985,369, Cl. 437-41.000.

Kyokuto Kaihatsu Kogyo Co., Ltd.: *See*—
Kimura, Ikuo, 4,984,748, Cl. 241-65.000.

Kyorin Pharmaceutical Co., Ltd.: *See*—
Ohashi, Mitsuo; Awano, Katsuya; Tanaka, Toshio; and Kimura, Tetsuya, 4,985,585, Cl. 560-9.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Yokoo, Yoshiharu; and Sugimoto, Seiji, 4,985,544, Cl. 530-399.000.

Labell, Larry. Green inclination level for golfers. 4,984,791, Cl. 273-32.00H.

Ladd, Charles B.: *See*—
Gilligan, Lawrence H.; and Ladd, Charles B., 4,985,773, Cl. 358-211.000.

Lafayette Applied Chemistry, Inc.: *See*—
Whistler, Roy L., 4,985,082, Cl. 127-33.000.

Lagoven S.A.: *See*—
Beomont, Jorge J., 4,985,696, Cl. 340-618.000.

L'Air Liquide, Society Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Duboc, Soraya; Renon, Henri; Laugier, Serge; Mizandjian, Jean-Luc; and Pean, Jean-Louis, 4,985,265, Cl. 426-425.000.

Lake Eyelet Manufacturing Company, Incorporated: *See*—
Hultgren, George W., 4,984,919, Cl. 401-78.000.

Lalonde, Michael: *See*—
Izume, Takatomo; and Lalonde, Michael, 4,985,612, Cl. 219-116.000.

Lalor, William F.: *See*—
Wilkes, Lambert H.; Mehner, Martin; and Lalor, William F., 4,984,334, Cl. 19-48.00R.

Lamanna, William M.: *See*—
Chou, Hsin-Hsin; Lamanna, William M.; and Wright, Robin E., 4,985,321, Cl. 430-38.000.

Lambda Electronics Inc.: *See*—
Cohen, Itzchak, 4,985,821, Cl. 363-95.000.

Lan, Ming-Shong: *See*—
Balban, Morton S.; Lan, Ming-Shong; and Panos, Rodney M., 4,984,773, Cl. 270-5.000.

Landa, Benzion; Ezuz, Shabtai; Karin, Jakob; and Fenster, Paul, to Spectrum Sciences B.V. Electrostatic separator. 4,985,732, Cl. 355-256.000.

Landers, Adrian L.; and Landers, Richard D., to Hi-Tech Engineering and Machine Company, Inc. Combined saw and chipper head. 4,984,614, Cl. 144-220.000.

Landers, Richard D.: *See*—
Landers, Adrian L.; and Landers, Richard D., 4,984,614, Cl. 144-220.000.

Landin, Donald T., to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesive having improved adhesion to plasticized vinyl substrates. 4,985,488, Cl. 524-555.000.

Landoussy, Claude: *See*—
Arretz, Emmanuel; Auge, Patrick; Mirassou, Alfred; and Landoussy, Claude, 4,985,586, Cl. 560-18.000.

Lane, George M., to Thermal Waste Management. Process for treating oil sludge. 4,985,131, Cl. 208-13.000.

Lang, David J.: *See*—
Von Stoutenborough, Eric; and Lang, David J., 4,984,473, Cl. 73-862.190.

Lang, Gerard: *See*—
Maignan, Jean; Restle, Serge; and Lang, Gerard, 4,985,563, Cl. 544-320.000.

Langberg, Edwin; and Caruso, F. Gerald, to Sensor Electronics, Inc. Active noise reduction system. 4,985,925, Cl. 381-72.000.

Lange, Steven R., to Wyko Corporation. Phase shifting device and method. 4,984,893, Cl. 356-376.000.

Langen, Gunter; and Jung, Harald, to Karl Otto Braun KG. Knitted hydrophobic web wound dressing. 4,984,570, Cl. 128-156.000.

Langenfeld, Wilhelm: *See*—
Bruckner, Raimund; Eschner, Axel; Langenfeld, Wilhelm; Oberbach, Manfred; Rothfuss, Hans; and Stusser, Dieter, 4,984,769, Cl. 266-44.000.

Langer, Friedrich H.; and Woodward, Michael J., to Weatherford U.S., Inc. Nozzle effect protectors, centralizers, and stabilizers and related methods. 4,984,633, Cl. 166-241.000.

Langston Machine Company Limited, The: *See*—
Bon, Henry, 4,984,963, Cl. 414-789.500.

Lansing, Ronald C. One-piece sunvisor extender. 4,984,840, Cl. 296-97.600.

Lanxide Technology Company, LP: *See*—
Nadkarni, S. K.; and Raghavan, Narasimha S., 4,985,382, Cl. 501-155.000.

Lapham, Jerome F.; and Brokaw, Adrian P., to Analog Devices, Incorporated. Low-leakage JFET. 4,985,739, Cl. 357-22.000.

Larkin, John P., to Wellcome Foundation Ltd., The. Pesticidal compounds. 4,985,582, Cl. 558-388.000.

Larsen, Jorgen G.: *See*—
Baden, Niels T.; Jensen, Ernst J.; and Larsen, Jorgen G., 4,985,230, Cl. 423-650.000.

Larson, James, to BridgeTech Inc. Weatherproof and fireproof loading bridge canopy. 4,984,321, Cl. 14-71.500.

Laska, Eugene M.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,985,459, Cl. 514-561.000.

Lassig, Stephan E.: *See*—
Crowley, John L.; Kermani, Ahmad; Lassig, Stephan E.; Johnson, Noel H.; and Rickords, Gary R., 4,984,902, Cl. 374-1.000.

Laue, Hans-Joachim: *See*—
Westeppe, Uwe; Lindner, Christian; Piejko, Karl-Erwin; and Laue, Hans-Joachim, 4,985,486, Cl. 524-514.000.

Laugier, Serge: *See*—
Duboc, Soraya; Renon, Henri; Laugier, Serge; Mizandjian, Jean-Luc; and Pean, Jean-Louis, 4,985,265, Cl. 426-425.000.

Lauser, Wolfgang: *See*—
Grimminger, Albert; Lauser, Wolfgang; Muller, Franz J.; Pfaff, Gerhard; and Schlipf, Edgar, 4,984,977, Cl. 425-145.000.

Laverion, Bernard H. M., to Ulstein Propeller A/S. Variable pitch propellers. 4,984,968, Cl. 416-146.00A.

Lawhead, Jack W.: *See*—
Brownlie, Alan W.; and Lawhead, Jack W., 4,984,982, Cl. 439-131.000.

Lawson, Edmund J.: *See*—
Egerton, Terence A.; Lawson, Edmund J.; and Frost, Peter W., 4,985,379, Cl. 501-104.000.

Lawson, R. J.: *See*—
Moser, Mark D.; Lawson, R. J.; Wang, Li; Parulekar, Vivekanand; Peer, Roger L.; and Hamlin, Charles R., 4,985,132, Cl. 208-65.000.

Laycock, John E.; and Ramirez, Ray C., to Sundstrand Corporation. Quick release filter by-pass valve. 4,985,142, Cl. 210-130.000.

Leak Sensors, Inc.: *See*—
Boryta, Daniel A., 4,985,682, Cl. 324-557.000.

Leake, Sam S. String of lights specification. 4,984,999, Cl. 439-425.000.

Learning Insights, Ltd.: *See*—
Boulton, David A., 4,985,697, Cl. 340-750.000.

LeBlanc, Jack: *See*—
Bonin, Yves; and LeBlanc, Jack, 4,985,485, Cl. 524-403.000.

Le Blanc, Maurice: *See*—
Charpiot, Brigitte; Greiner, Jacques; Le Blanc, Maurice; Manfredi, Alexandre; Riess, Jean; and Zarif, Leila, 4,985,550, Cl. 536-18.400.

LeBourgeois, Luc, to Intercontrole Societe Anonyme. Intervention device, particularly for checking, inspecting and maintaining heat exchangers. 4,984,627, Cl. 165-11.200.

Lechner, Magister H. Chopping- and slicing machine. 4,984,747, Cl. 241-55.000.

Leclerc, Jean-Yves: *See*—
Dulong, Carole; Leclerc, Jean-Yves; and Scaglia, Patrick, 4,985,831, Cl. 364-200.000.

Lecolier, Serge L.: *See*—
Wimmer, Eric P.; Lecolier, Serge L.; Ducrocq, Claire A.; Servy, Claudine G.; and Lenfant, Maryse T., 4,985,357, Cl. 435-128.000.

LeDoux, Patrick; and Fourgaut, Lue, to Pipe Liners, Inc. Pipe liner process. 4,985,196, Cl. 264-516.000.

Lee, Chi-long: *See*—
Baney, Ronald H.; Bilgrien, Carl J.; Fiedler, Lawrence D.; and Lee, Chi-long, 4,985,565, Cl. 548-110.000.

Lee County Mosquito Control District: *See*—
Levy, Richard, 4,985,251, Cl. 424-404.000.

Lee, Jung-Sup, to Samsung Electronics Co., Ltd. Method for interfacing between a key-phone system and a key-phone subscriber. 4,985,915, Cl. 379-165.000.

Lee, Nicholas A.; and Toonen, James E., to Minnesota Mining and Manufacturing Company. Thermoplastic adhesive mounting apparatus and method for an optical fiber connector. 4,984,865, Cl. 350-96.200.

Lee, Victor. Pen structure with a flag. 4,984,379, Cl. 40-334.000.

Lee, Yuan-Ho. Form with form stripping mechanism. 4,984,764, Cl. 249-33.000.

Leeson, Plato J.; and Wardle, John W., to Woodward Governor Company. Multiplexed hydraulic control systems. 4,984,505, Cl. 91-361.000.

Le Fur, Joel: *See*—
Tikes, Jacques; Le Fur, Joel; and Nugues, Pierre, 4,985,659, Cl. 315-3.500.

Leiber, Heinz; Ohnemuller, Hans; Kastner, Klaus; and Richter, Karl-Heinz, to Mercedes-Benz AG. Motor vehicle with an automatic limited-slip differential. 4,984,649, Cl. 180-197.000.

Leik, Mervyn J.: *See*—
Bubica, Svetko; and Leik, Mervyn J., 4,985,598, Cl. 174-93.000.

Leinert, Herbert, to Boehringer Mannheim GmbH. Process for the preparation of optically-active carbazole derivatives, new R- and S-carbazole derivatives and pharmaceutical compositions containing these compounds. 4,985,454, Cl. 514-411.000.

Leising, Frederic; and Torres, Ghislaine, to Rhone-Poulenc Chimie. Magnetizable composite particles based on cross-linked organopolysiloxane, process for preparation thereof and their application in biology. 4,985,166, Cl. 252-62.540.

Leitz, Edgar: *See*—
Eckel, Thomas; Wittmann, Dieter; Leitz, Edgar; Schoeps, Jochen; Ott, Karl-Heinz; and Peters, Horst, 4,985,493, Cl. 525-67.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Jameson, John W., 4,984,951, Cl. 414-1.000.
Pauly, John M., 4,985,677, Cl. 324-309.000.

Lemke, William E.; and Reshell, Gregory G. Weight suspension apparatus for squat exercises. 4,984,786, Cl. 272-119.000.

Lemoine, Joseph, to MTU Friedrichshafen GmbH. Material for the conduction of protons and method of making the same. 4,985,315, Cl. 429-33.000.

Lendermon, Gary M.: *See*—
Aseltine, Cliff L.; and Lendermon, Gary M., 4,984,520, Cl. 102-313.000.

Lenfant, Maryse T.: *See*—
Wimmer, Eric P.; Lecolier, Serge L.; Ducrocq, Claire A.; Servy, Claudine G.; and Lenfant, Maryse T., 4,985,357, Cl. 435-128.000.

Lenti, Daria: *See*—
Moggi, Giovanni; Ingoglia, Desiderata; and Lenti, Daria, 4,985,282, Cl. 427-393.000.

Leo, Michael F.: *See*—
Alexander, Thomas R.; Evangelista, Donato D.; and Leo, Michael F., 4,984,778, Cl. 271-117.000.

Leonard, Elizabeth C.; and Shurtleff, Jill M., to Gillette Company, The. Safety razor. 4,984,365, Cl. 30-34.050.

Leonberger, Frederick J.: *See*—
Suchoski, Paul G., Jr.; Findakly, Talal K.; and Leonberger, Frederick J., 4,984,861, Cl. 350-96.110.

Leone, John. Apparatus for continuous formation of concrete curbs. 4,984,932, Cl. 404-72.000.

Lepissier, Jean-Jacques, to S.N.E.LA Calhene. Device for sealing the end of a flexible collar to a flexible tubular wall. 4,984,828, Cl. 285-200.000.

Le Queau, Marcel: *See*—
Haghiri, Mohammad R.; Guntzburger, Philippe; and Le Queau, Marcel, 4,985,767, Cl. 358-133.000.

Lerch, Hans-Reter: *See*—
Gotz, Eckart; Lerch, Hans-Reter; Dorsam, Thomas; Schweigert, Gerhard; Wittmann, Werner; and Korner, Michael, 4,985,845, Cl. 364-492.000.

Letemps, Bernard; and Dereims, Philippe, to Saint-Gorbain Vitrage International. Method and apparatus for positioning a glass sheet traveling on a conveyor. 4,985,059, Cl. 65-62.000.

Leunbach, Ib, to Hafslund Nycomed Innovation AB. Method of electron spin resonance enhanced magnetic resonance imaging. 4,984,573, Cl. 128-653.000.

Lev-Ran, Arye: *See*—
Hwang, David; Lev-Ran, Arye; and Barseghian, Ken, deceased, 4,985,439, Cl. 514-312.000.

Levan, William C. High index color encoding system. 4,985,754, Cl. 358-23.000.

Lever Brothers Company, Division of Conopco, Inc.: *See*—
Madison, Stephen A.; Ilardi, Leonora M.; and Cerfontain, Hans, 4,985,561, Cl. 544-158.000.

Levinstein, Hyman J.; Powell, William D., Jr.; and Sinha, Ashok K., to AT&T Bell Laboratories. Multiple insulating layer for two-level interconnected metallization in semiconductor integrated circuit structures. 4,985,373, Cl. 437-195.000.

Levrai, Roland: *See*—
Thioux, Alain; and Levrai, Roland, 4,984,853, Cl. 303-22.800.

Levy, Richard, to Lee County Mosquito Control District. Flowable insecticidal delivery compositions and methods for controlling insect populations in an aquatic environment. 4,985,251, Cl. 424-404.000.

Lewis, David F.; Schenfele, Robert D.; and Winkler, Thomas, to GAF Chemicals Corporation. Protective coatings for polyacetylenic recording media. 4,985,290, Cl. 428-76.000.

Leybold Aktiengesellschaft: *See—*
Choudhury, Alok, 4,985,400, Cl. 505-1.000.
Reuter, Wolfgang, 4,984,952, Cl. 414-180.000.
Zejda, Jaroslav; and Schuhmacher, Manfred, 4,984,531, Cl. 118-50.000.

LGZ Landis & Gyr Zug AG: *See—*
Antes, Gregor; and Saxer, Christian, 4,984,824, Cl. 283-91.000.

Li, Fu-Mian: *See—*
Goldberg, Eugene P.; Li, Fu-Mian; and Luo, Ching-Wang, 4,985,559, Cl. 544-34.000.

Liang, Enju: *See—*
Husseiny, Abdo A.; Liang, Enju; and Rodriguez, Rodrigo, 4,985,824, Cl. 364-187.000.

Libbey, Christopher J.: *See—*
Hansen, Paul E.; and Libbey, Christopher J., 4,984,584, Cl. 128-898.000.

Lichtfuss, Gerhardt E., to Sundstrand Corporation. Demisting screen arrangement for two-phase thermal management system. 4,984,625, Cl. 165-104.250.

Lin, Yuang-Chang. Uninterrupted desk lamp. 4,985,661, Cl. 315-87.000.

Lincoln, Robert A. Nose-worn air filter. 4,984,302, Cl. 2-206.000.

Lindahl, Per A. A., to Telefonaktiebolaget L M Ericsson. Connection plug for a microwave unit. 4,984,990, Cl. 439-63.000.

Lindberg, Bernt J.: *See—*
Klaveness, Jo; Jacobsen, Trond; and Lindberg, Bernt J., 4,985,233, Cl. 424-9.000.

Lindner, Christian: *See—*
Westeppe, Uwe; Lindner, Christian; Piejko, Karl-Erwin; and Laue, Hans-Joachim, 4,985,486, Cl. 524-514.000.

Lindsay, Robert J.; Bell, Rodney E.; and McNickle, William, to Foote & Davies, Inc. Binding and collating techniques. 4,984,948, Cl. 412-1.000.

Lindsey, Edgar F.; and Moran, Stephen G., to Lindsey, Edgar F. Demolition hammer. 4,984,639, Cl. 173-100.000.

Lineman, David J.: *See—*
Eyl, Kevin A.; Kurkjian, Andrew L.; Lineman, David J.; Pierce, Edward A.; and Steiner, Joseph M., Jr., 4,985,873, Cl. 367-27.000.

Lingertat, Arnold; and Swieringa, Morris K., to McNeil-PPC, Inc. Adhesive closure system for disposable diapers. 4,985,025, Cl. 604-390.000.

Lintec Co., Ltd.: *See—*
Isoda, Yoritaka, 4,984,460, Cl. 73-204.150.

Lipton, James M., to Board of Regents, The University of Texas System. Safety surgical blade, handle and shield. 4,985,034, Cl. 606-167.000.

Lischke, Burkhard: *See—*
Brunner, Matthias; Frosien, Juergen; Schmitt, Reinhold; and Lischke, Burkhard, 4,985,681, Cl. 324-501.000.

Little, Vicki A. Multi-purpose utility tote. 4,984,906, Cl. 383-4.000.

Liu, Ten-An. Massaging apparatus. 4,984,569, Cl. 128-57.000.

Liu, Yaguang. Pharmaceutical composition for inhibiting viruses and increasing immune function (PII). 4,985,247, Cl. 424-195.100.

Liu, Yaguang. Pharmaceutical composition containing a safe extracts of fruits and vegetables for the treating and preventing of diabetes. 4,985,248, Cl. 424-195.100.

Liu, Yaguang. Pharmaceutical composition for treating and preventing cardiovascular disease. 4,985,408, Cl. 514-25.000.

Liu, Yaguang. Pharmaceutical composition for treating and preventing cardiovascular disease. 4,985,431, Cl. 514-255.000.

LK Technologies, Inc.: *See—*
Campbell, Charles T., 4,985,657, Cl. 313-362.100.

Llort, Francisco M.; and Jerome, Manuel R., Jr., to Acushnet Company. Golf ball cover composition. 4,984,803, Cl. 273-235.00R.

Lockheed Corporation: *See—*
Peppel, George W.; and Sullivan, Paul E., 4,984,827, Cl. 285-133.100.

Locotos, Frank M.: *See—*
Scott, Ralph F., Jr.; and Locotos, Frank M., 4,984,938, Cl. 405-261.000.

Loeber, Peter J.: *See—*
Lytra, Eric; Loeber, Peter J.; and Simkins, Barry, 4,985,613, Cl. 235-101.000.

Logan, Jonothan L.: *See—*
Goldberg, Seth; and Logan, Jonothan L., 4,984,574, Cl. 128-653.00A.

Login, Robert B.; Merianos, John J.; Dandreaux, Gary; and Shih, Jenn S., to GAF Chemicals Corporation. Polymerizable derivatives of 5-oxo-pyrrolidinecarboxylic acid. 4,985,521, Cl. 526-264.000.

Logsdail, Dennis H.: *See—*
Parker, Douglas E.; and Logsdail, Dennis H., 4,985,141, Cl. 210-90.000.

Lok, Brent M. T.; Marcus, Bonita K.; Vail, Lawrence D.; Flanigen, Edith M.; Patton, Robert L.; and Wilson, Stephen T., to UOP. Process for separating molecular species. 4,985,151, Cl. 210-689.000.

Lok, Yuk L. Large-burner stove with high heat exhaust ducting. 4,984,558, Cl. 126-39.00R.

Lombardi, Massimo: *See—*
Santandrea, Luciano; and Lombardi, Massimo, 4,984,353, Cl. 29-714.000.

Lommen, Etienne J. C. M. P.; Wildevuur, Charles R. H.; and Hinrigs, Wouter L. J., to Koninklijke Utermohlin N.V. Artificial skin. 4,985,036, Cl. 623-15.000.

Long, Bruce R., to PPA Industries, Inc. Low power temperature-controlled frequency-stabilized oscillator. 4,985,687, Cl. 331-69.000.

Long, Michael E.; and Stramello, Peter, to Zenith Electronics Corporation. Television signal decoder bypass switch. 4,985,772, Cl. 358-181.000.

Lonseal Corporation: *See—*
Moriizumi, Shuichi; Masuhara, Kenichi; Yamabe, Hidetoshi; Tomosue, Takao; Mori, Kouji; and Kaneko, Hisaharu, 4,985,104, Cl. 156-244.110.

L'Oreal: *See—*
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Maignan, Jean; Restle, Serge; and Lang, Gerard, 4,985,563, Cl. 544-320.000.

Lork, Winfried: *See—*
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Lovisolo, Pierpaolo: *See—*
Cozzi, Paolo; Carganico, Germano; Severino, Dino; Lovisolo, Pierpaolo; and Chiari, Augusto, 4,985,440, Cl. 514-397.000.

Lowry, Robert D. Drain system. 4,984,309, Cl. 4-288.000.

Lozinski, Janusz: *See—*
Toczyski, Zygmunt; Kruczynski, Stanislaw W.; Frackiewicz, Henryk; Lozinski, Janusz; Chlopek, Zdzislaw; Danilczyk, Wiktor; Ranachowski, Jerzy; Janula, Janusz; and Wolski, Lech, 4,984,550, Cl. 123-478.000.

LTC International B.V.: *See—*
Van Leeuwen, Jacob K. L., 4,984,397, Cl. 51-425.000.

Lubowitz, Hyman R.; and Sheppard, Clyde H., to Boeing Company, The. Method of making crosslinking imidophenylamines. 4,985,568, Cl. 548-431.000.

Lubrano, Rocco V.; and Cubranich, Ladislaw D., to Unisys Corporation. Tool for inserting/extracting package from socket on PC board. 4,984,355, Cl. 29-741.000.

Ludke, Siegwalt: *See—*
Cline, Harvey E.; Hartley, Richard I.; Ludke, Siegwalt; and Noujaim, Sharbel E., 4,985,834, Cl. 364-413.220.

Luebbe, John P.: *See—*
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Luhrig, Hermann: *See—*
Hoffacker, Franz; Kovacic, Guido; and Luhrig, Hermann, 4,984,751, Cl. 242-74.000.

Lunde, Gerald D.; and Harvey, Harold H., Jr., to Tri-State Oil Tools, Inc. Method of securing cutting elements on cutting tool blade. 4,984,488, Cl. 76-115.000.

L'Unite Hermetique: *See—*
Bergeron, Emile, 4,984,971, Cl. 417-363.000.

Luo, Ching-Wang: *See—*
Goldberg, Eugene P.; Li, Fu-Mian; and Luo, Ching-Wang, 4,985,559, Cl. 544-34.000.

Lurssen, Klaus: *See—*
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Lyell, Mark S. Needle stop surgical instrument. 4,985,038, Cl. 506-148.000.

Lyons, Harold W., to Whelen Technologies, Inc. Warning light with quadruple reflective surfaces. 4,985,814, Cl. 362-240.000.

Lytra, Eric; Loeber, Peter J.; and Simkins, Barry, to Pitney Bowes Inc. Locking arrangement. 4,985,613, Cl. 235-101.000.

Lywood, Warwick J., to Imperial Chemical Industries PLC. Production of hydrogen-containing gas streams. 4,985,231, Cl. 423-652.000.

M.A.N. Maschinenfabrik Augsburg-Nuremberg AG: *See—*
Druppel, Johannes; and Schlagbohmer, Hermann, 4,984,771, Cl. 266-142.000.

Maassen, Heinz; and Meyer, Gunter, to N.V. Michel Van de Wiele. Planetary gripper bar drive with adjustable crank and lever arm lengths. 4,984,609, Cl. 139-449.000.

Macho Products, Inc.: *See—*
Cho, Soo Se, 4,984,300, Cl. 2-18.000.

Mackley, James S.: *See—*
Emmons, Lawrence D.; Mackley, James S.; Stokes, David H.; Stefenel, Rudolph S.; Brisko, William E., Jr.; and Cooper-Hart, Michael A., 4,985,911, Cl. 379-53.000.

MacLean, Murdo S., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Method of making sintered aluminium nickel alloys. 4,985,200, Cl. 419-19.000.

Madan, Ashvani K.: *See—*
Basile, Peter A.; Madan, Ashvani K.; Snyder, Fred E.; and Stillman, Harold M., 4,984,311, Cl. 4-354.000.

Madgavkar, Ajay M., to Shell Oil Company. Two-step heterocyclic nitrogen extraction from petroleum oils with reduced refinery equipment. 4,985,139, Cl. 208-321.000.

Madge Networks Limited: *See—*
Madge, Robert; and Woodfield, David, 4,985,888, Cl. 370-85.500.

Madge, Robert; and Woodfield, David, to Madge Networks Limited. Token ring system hierarchy. 4,985,888, Cl. 370-85.500.

Madison, Stephen A.; Ilardi, Leonora M.; and Cerfontain, Hans, to Lever Brothers Company, Division of Conopco, Inc. Sulfur trioxide sulfonation of aromatic chloroformates. 4,985,561, Cl. 544-158.000.

Maeda, Fuzio: *See—*
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Maeda, Kazuyuki: *See—*
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Maeda, Kei: *See—*
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Maeda, Naohiro, to Hitachi, Ltd. Flow-control valve. 4,984,766, Cl. 251-129.110.

Maeda, Takeshi: *See—*
Nakamura, Shigeru; Tsunoda, Yoshito; and Maeda, Takeshi, 4,985,616, Cl. 235-494.000.

Maeda, Tomohisa; and Tsujita, Kazuhiko, to Kabushiki Kaisha Toshiba. RF coil system in magnetic resonance imaging apparatus. 4,985,680, Cl. 324-322.000.

Maeda, Yorishige: *See—*
Kaede, Hiroshi; Koike, Tadahiro; Kato, Shinji; Maeda, Yorishige; Fuwa, Yoshio; Sugimoto, Shigetoshi; Aoyagi, Hikaru; and Shibata, Shinzi, 4,985,092, Cl. 148-326.000.

Maeno, Shinichiro: *See—*
Tokunaga, Yukio; Kaku, Koichiro; Kojima, Yoshiyuki; Maeno, Shinichiro; Sawai, Nobumitsu; and Saso, Yasuo, 4,985,432, Cl. 514-258.000.

Maeser, Martin: *See—*
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Maeshima, Katsuyoshi; Takeda, Atsushi; Arimoto, Shinobu; and Hasegawa, Shizuo, to Canon Kabushiki Kaisha. Color imager having varying filter aperture sizes to compensate for luminance differences between colors. 4,985,760, Cl. 358-80.000.

Magenta Corporation: *See—*
Groya, Robert J.; and Hofman, Richard W., 4,984,720, Cl. 222-531.000.

Magnusson, Reine, to Sparring Elfa AB. Combined string basket and string shelf system. 4,984,694, Cl. 211-186.000.

Maignan, Jean; Restle, Serge; and Lang, Gerard, to L'Oreal. Process for the preparation of 6-piperidino-2,4-diamino pyrimidine-3-oxide. 4,985,563, Cl. 544-320.000.

Maisch, Gunter; Haag, Alfons; and Wood, Ken, to Preh, Elektrofeinmechanische Werke Jakob Preh, Nachf, GmbH & Co. Shielded circular plug connector. 4,985,002, Cl. 439-607.000.

Makimoto, Mitsuo: *See—*
Eguchi, Kazuhiro; Ochiai, Eiichi; Ito, Shinichiro; Yoneda, Takehiko; Taki, Hiromitsu; Noguchi, Toshiharu; Kiyosue, Kuniaki; Yoshida, Akiro; Sagawa, Morikazu; and Makimoto, Mitsuo, 4,985,690, Cl. 333-222.000.

Makino, Naonori: *See—*
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Makino, Osamu: *See—*
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Makino, Satoshi; Sasaki, Keiko; and Nakagawa, Masaharu, to Kitasato Institute, The. Stabilized live attenuated vaccine and its production. 4,985,244, Cl. 424-89.000.

Makita, Shigeru: *See—*
Kobayashi, Toshiyuki; Makita, Shigeru; and Ota, Hiroyuki, 4,984,895, Cl. 356-423.000.

Malarz, Antoni J.: *See—*
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Male, Terence P.: *See—*
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Mallon, Charles B.: *See—*
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Manfredi, Alexandre: *See—*
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Mannesmann AG: *See—*
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Manns, Willims G.: *See—*
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Mano, Hiroyuki; Takashi, Terumi; Fujisawa, Kazuhiro; Hasegawa, Kaoru; Matsumoto, Shinzo; and Fujita, Mitsuhisa, to Hitachi, Ltd. Display panel driving apparatus. 4,985,698, Cl. 340-784.000.

Maontovani, Marisa: *See—*
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Marafino, Benedict J., Jr.: *See—*
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Maraganore, John M.; and Kindsvogel, Wayne R., to ZymoGenetics, Inc. Novel cytotoxic protein. 4,985,541, Cl. 530-370.000.

Marcantonio, Ben A.: *See—*
Springer, Jack F., Jr.; Smith, Timothy S.; Cloutier, Cathy A.; Marcantonio, Ben A.; and Willis, Richard A., 4,984,571, Cl. 128-371.000.

Marcoll, Joachim: *See—*
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Marcus, Bonita K.: *See—*
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Marcus, Sanford M.: *See—*
El-Sayed, Lyla M.; Marcus, Sanford M.; and Trout, Torence J., 4,985,329, Cl. 430-115.000.

Marczewski, Richard W.: *See—*
Bajpai, Atul; Marczewski, Richard W.; Marek, Melissa M.; Shrivastava, Anil B.; Amble, Charles S.; Joyce, Robert H.; Kishore, Nanda; and Ollanik, Steven J., 4,985,857, Cl. 364-551.010.

Marek, Melissa M.: *See—*
Bajpai, Atul; Marczewski, Richard W.; Marek, Melissa M.; Shrivastava, Anil B.; Amble, Charles S.; Joyce, Robert H.; Kishore, Nanda; and Ollanik, Steven J., 4,985,857, Cl. 364-551.010.

Margaria, Mario, to Alplast S.p.A. Tamper-evident closure. 4,984,701, Cl. 215-256.000.

Margulies, Marcel, to Perkin-Elmer Corporation, The. Quadrupole mass filter for charged particles. 4,985,626, Cl. 250-292.000.

Marhold, Albrecht: *See—*
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 4,985,063, Cl. 71-88.000.

Marquip Inc.: *See—*
Marschke, Carl R., 4,985,012, Cl. 493-373.000.

Marriott, Christopher: *See—*
Baker, James A.; James, Stuart L.; Ibrahim, Tuncel; and Marriott, Christopher, 4,985,462, Cl. 514-623.000.

Marrs, Samuel M.; Herodes, Victor; and Ransom, David, to Occupant Safety Systems Inc. Safety belt retractor and method of manufacture. 4,984,752, Cl. 242-107.40A.

Mars Incorporated: *See—*
McGarry, Patrick J., 4,985,910, Cl. 379-27.000.

Marschke, Carl R., to Marquip Inc. Apparatus for stripping scrap from die cut blanks. 4,985,012, Cl. 493-373.000.

Marscholl, Klaus; and Medebach, Thomas, to Kuester & Co. Tensioning device for cable window lifter. 4,984,386, Cl. 49-352.000.

Marshall, Alexander J.: *See—*
Bradford, William G.; Arsenault, Gilles J.; and Marshall, Alexander J., 4,985,540, Cl. 528-482.000.

Marshall, Bryan H., to Unistrut Australia Pty. Limited. Vehicle roof rack. 4,984,726, Cl. 224-331.000.

Martin Marietta Corporation: *See—*
Moshier, William C.; Brupbacher, John M.; Christodoulou, Leontios; and Nagle, Dennis C., 4,985,202, Cl. 420-590.000.

Martin Paul, Inc.: *See—*
Belokin, Paul, Jr.; and Belokin, Martin, 4,984,693, Cl. 211-88.000.

Martinez, Eugene. Optical rear projection screen hanger assembly. 4,984,871, Cl. 350-117.000.

Martinez, Romulo M.: *See—*
Hudson, Earl K.; Martinez, Romulo M.; and Woodward, James R., 4,984,732, Cl. 228-173.200.

Martone, James F.: *See—*
Findlay, Hugh T.; Froman, Kenneth H.; and Martone, James F., 4,984,912, Cl. 400-240.200.

Maruki, Toshimitsu: *See—*
Mizushina, Fumio; Goto, Takashi; and Maruki, Toshimitsu, 4,984,988, Cl. 434-380.000.

Masco Corporation: *See—*
Pickerrell, Daniel A.; and Inch, John, 4,984,312, Cl. 4-378.000.

Masco Industries, Inc.: *See—*
DeLand, Daniel L., 4,984,385, Cl. 49-280.000.

Mashimo, Shinya: *See—*
Kakumaru, Hajime; Minami, Yoshitaka; Kubota, Naohiro; and Mashimo, Shinya, 4,985,564, Cl. 546-104.000.

Masini, Jean-Jacques; and Verot, Yvan, to Atochem. Simultaneous producting of higher chloromethanes. 4,985,214, Cl. 422-188.000.

Massachusetts Institute of Technology: *See—*
Aull, Brian F.; Nichols, Kirby B.; and Sollner, T. C. L. Gerhard, 4,985,621, Cl. 250-213.00A.
Curley, Michael G., 4,985,123, Cl. 204-153.100.

Masuda, Norihiro, to Shinko Electric Industries Co., Ltd. Taping apparatus for lead frame. 4,985,105, Cl. 156-261.000.

Masuda, Tetsuya: *See—*
Sasa, Nobumasa; Shimizu, Kunio; Watanabe, Manabu; Urano, Toshiyuki; Mayama, Shinya; and Masuda, Tetsuya, 4,985,337, Cl. 430-254.000.

Masuda, Yoshihiro; Yagi, Takashi; and Nishimura, Eiji, to Dainippon Screen Mfg. Co., Ltd. Method of controlling temperature for drying photosensitive material. 4,985,720, Cl. 354-299.000.

Masuhara, Kenichi: *See*—
Moriizumi, Shuichi; Masuhara, Kenichi; Yamabe, Hidetoshi; Tomosue, Takao; Mori, Kouji; and Kaneko, Hisaharu, 4,985,104, Cl. 156-244.110.

Masujima, Kiyoshi: *See*—
Naya, Koutarou; Shiinoki, Kazuaki; Hayakawa, Tadashi; Masujima, Kiyoshi; Uchida, Riichi; and Matsubara, Katsumi, 4,984,974, Cl. 418-87.000.

Matalon, Ralph. Dye assistant composition for hydrophobic fibers. 4,985,041, Cl. 8-130.100.

Matejec, Reinhart; Odenwalder, Heinrich; Ohlschlager, Hans; and Wolff, Erich, to Agfa-Gevaert Aktiengesellschaft. Photographic recording material. 4,985,351, Cl. 430-598.000.

Mathias, Lon J.; and Kurz, David W., to University of Southern Mississippi, The. Polymers containing pendant urea groups. 4,985,522, Cl. 526-288.000.

Matsubara, Akira: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,573, Cl. 549-402.000.
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,574, Cl. 549-402.000.

Matsubara, Katsumi: *See*—
Naya, Koutarou; Shiinoki, Kazuaki; Hayakawa, Tadashi; Masujima, Kiyoshi; Uchida, Riichi; and Matsubara, Katsumi, 4,984,974, Cl. 418-87.000.

Matsubara, Motonari: *See*—
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Matsubara, Yoshihiro: *See*—
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Matsuda, Hiromu; Taguchi, Nobuyoshi; Imai, Akihiro; and Yubakami, Keiichi, to Matsushita Electric Industrial Co., Ltd. Thermal dye transfer printing systems, thermal printing sheets, and dye receiving sheets. 4,985,399, Cl. 503-227.000.

Matsuda, Ryuichi: *See*—
Sawaoka, Akira; Matsuda, Ryuichi; and Kondo, Tadashi, 4,985,401, Cl. 505-1.000.

Matsuda, Shuichi: *See*—
Watakabe, Yaichiro; Okamoto, Tatsuo; and Matsuda, Shuichi, 4,985,319, Cl. 430-5.000.

Matsuda, Yoshiaki: *See*—
Samejima, Kazuo; Kawakita, Hiroaki; Togoshi, Yoshikazu; Matsuda, Yoshiaki; Sakatsuji, Takao; and Fulford, Colin, 4,984,420, Cl. 56-203.000.

Matsugu, Masakazu: *See*—
Nose, Noriyuki; Nakajima, Toshiyuki; Kawakami, Eigo; Baba, Takeshi; Kushibiki, Nobuo; Matsugu, Masakazu; and Niwa, Yukichi, 4,985,186, Cl. 264-1.700.

Matsui, Hirokazu; and Murase, Shinzo, to Matsushita Electric Industrial Co., Ltd.; and Maytaku System. Surface light source panel. 4,985,809, Cl. 362-31.000.

Matsui, Isamu; and Tone, Shoichi, to Murata Kikai Kabushiki Kaisha. Operation controlling method for textile machine. 4,984,749, Cl. 242-35.50R.

Matsumoto, Kesafumi, to Kouken Co., Ltd. Electrode water circulation and processing system and hooded radiator for water rheostat. 4,984,623, Cl. 165-104.330.

Matsumoto, Satoshi; Azuma, Daisuke; and Miyata, Souichi, to Sharp Kabushiki Kaisha. Data transmission unit. 4,985,890, Cl. 370-94.100.

Matsumoto, Shinzo: *See*—
Mano, Hiroyuki; Takashi, Terumi; Fujisawa, Kazuhiro; Hasegawa, Kaoru; Matsumoto, Shinzo; and Fujita, Mitsuhisa, 4,985,698, Cl. 340-784.000.

Matsumoto, Shoichi: *See*—
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Matsumoto, Takeshi; Suzuki, Yuji; Kumagai, Masahiro; and Uchibori, Shinya, to Tokai Metals Co., Ltd. Resonant frequency characteristic tag and method of manufacturing the same. 4,985,288, Cl. 428-40.000.

Matsumoto, Toshio: *See*—
Nagashima, Nobuyoshi; Matsumoto, Toshio; Yasuda, Shuhei; Kawaguchi, Takafumi; and Takeda, Makoto, 4,985,770, Cl. 358-152.000.

Matsumoto, Yukiharu: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Unno, Ryoichi; Matsumoto, Yukiharu; Kimura, Hiromoto; Oka, Mitsuru; and Sawai, Kiichi, 4,985,569, Cl. 548-453.000.

Matsumura, Daisuke: *See*—
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Matsumura, Kazuo; Nagata, Mitsuhiro; and Tanaka, Tadashi, to Kabushiki Kaisha Toshiba. Joined metal composite and method for production thereof. 4,985,097, Cl. 156-87.000.

Matsumura, Takumi: *See*—
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Matsunaga, Akira; Wakatsuki, Junya; Horinishi, Nobutaka; Imamura, Takashi; and Kurosaki, Tomihiro, to Kao Corporation. Phosphoric acid ester, process for preparing the same, and detergent composition containing the same. 4,985,412, Cl. 514-70.000.

Matsunaga, Kenichi: *See*—
Sugita, Norifumi; Niimura, Koichi; Oguchi, Yoshiharu; Hirose, Kunitaka; Matsunaga, Kenichi; Oohara, Minoru; Muto, Shigeaki; Kakuchi, Junji; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 4,985,543, Cl. 530-396.000.

Matsunaga, Tatsuaki: *See*—
Iwanaga, Shin-ichiro; Matsunaga, Tatsuaki; Nishiwaki, Ituo; and Enyo, Hiroji, 4,985,513, Cl. 526-80.000.

Matsuno, Kazuhiro; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, to Ajinomoto Co., Inc. Benzylidene compounds, cosmetic compositions containing the same and ultraviolet absorber comprising the same. 4,985,237, Cl. 424-59.000.

Matsuno, Kenichi: *See*—
Ohuchi, Kiyoyuki; Nakazawa, Yoshinori; and Matsuno, Kenichi, 4,984,445, Cl. 72-360.000.

Matsuo, Noritada: *See*—
Kishino, Hiroko; Matsuo, Noritada; Takagaki, Tohei; Tsushima, Kazunori; Yano, Toshihiko; and Torisu, Yoko, 4,985,457, Cl. 514-531.000.
Mitsuda, Satoshi; Matsuo, Noritada; and Hirohara, Hideo, 4,985,365, Cl. 435-280.000.

Matsuo, Takaharu: *See*—
Sawamura, Norio; Matsuo, Takaharu; and Hashimoto, Yukio, 4,985,358, Cl. 435-134.000.

Matsuoka, Hidetoshi; and Natsume, Masahito, to Canon Kabushiki Kaisha. Rotary head type reproducing apparatus. 4,985,785, Cl. 360-62.000.

Matsuoka, Yoshito: *See*—
Hayashi, Kenichi; and Matsuoka, Yoshito, 4,985,520, Cl. 526-254.000.

Matsushige, Naoki: *See*—
Sakashita, Kiichiro; Tanikawa, Hirohide; Yoshida, Satoshi; Nakahara, Toshiaki; Matsushige, Naoki; Fujiwara, Masatsugu; and Mitsuhashi, Yasuo, 4,985,327, Cl. 430-106.600.

Matsushima, Jun; Kageyama, Tetsuto; Nakamura, Shigekazu; and Wakazono, Kenji, to Copal Company Limited. Torque sensor. 4,984,474, Cl. 73-862.330.

Matsushita Electric Industrial Co., Ltd.: *See*—
Arai, Kazuo; Ota, Kiyoshi; and Wakiyama, Kouji, 4,985,786, Cl. 360-70.000.
Eguchi, Kazuhiro; Ochiai, Eiichi; Ito, Shinichiro; Yoneda, Takehiko; Taki, Hiromitsu; Noguchi, Toshiharu; Kiyosue, Kuniaki; Yoshida, Akiro; Sagawa, Morikazu; and Makimoto, Mitsuo, 4,985,690, Cl. 333-222.000.
Furuya, Nobuaki; Ono, Takuhiro; Horiuchi, Naoya; Yamanaka, Keiichro; and Miyata, Takeo, 4,985,898, Cl. 372-106.000.
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Matsui, Hirokazu; and Murase, Shinzo, 4,985,809, Cl. 362-31.000.
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Tabata, Munehiro; Hayashi, Chiharu; Isozaki, Yasuhito; Okano, Kazuyuki; and Hasegawa, Yo, 4,985,071, Cl. 75-246.000.
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Yohda, Hiroshi; and Inoue, Yasushi, 4,985,797, Cl. 360-126.000.

Matsushita Electric Industrial Co., Ltd: *See*—
Kawakami, Tetsuji; Imai, Akihiro; Taguchi, Nobuyoshi; Murata, Yukichi; and Hirota, Takao, 4,985,396, Cl. 503-227.000.

Matsushita Electric Works, Ltd.: *See*—
Hashimoto, Noboru; Sawada, Yasushi; Yoden, Hiroyoshi; Deki, Shigehito; and Takahashi, Hisamitsu, 4,985,225, Cl. 423-412.000.

Matsuura, Hiroshi, to Kabushiki Kaisha Toshiba. Speech recognition apparatus. 4,985,924, Cl. 381-43.000.

Matsuura, Ichiro: *See*—
Sugiura, Takashi; Matsuura, Ichiro; Miyauchi, Fumio; and Chiyoshi, Toyoharu, 4,985,189, Cl. 264-26.000.

Matsuura, Masahiro: *See*—
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Matsuura, Mitsuyuki; and Fujita, Takashi, to Mitsubishi Petrochemical Company, Ltd. Process for polymerization of α-olefin. 4,985,515, Cl. 526-125.000.

Matsuyama, Futoshi; Hirose, Akira; and Takei, Toshiyuki, to Brother Kogyo Kabushiki Kaisha. Machine tool. 4,984,351, Cl. 29-568.000.

Matsuzawa, Hideo: *See*—
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Ishii, Kazuhiro, 4,985,592, Cl. 562-534.000.

Mattauch, Gerhard: *See*—
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Matthaei, Hans-Detlef: *See*—
Sommer, Herbert; Arlt, Dieter; Hartwig, Jurgen; Homeyer, Bernhard; and Matthaei, Hans-Detlef, 4,985,415, Cl. 514-118.000.

Matuura, Hidekazu; Miyadera, Yasuo; and Kato, Toshihiko, to Hitachi, Ltd. Heat curable resin composition. 4,985,509, Cl. 525-426.000.

Matysek, James F.: *See*—
Sampath, Barbara A.; Matysek, James F.; and Taylor, Thomas N., 4,985,729, Cl. 355-206.000.

Mauer GmbH: *See*—
Mauer, Guenter, 4,984,441, Cl. 70-277.000.

Mauer, Guenter, to Mauer GmbH. Electrically controlled bolt lock. 4,984,441, Cl. 70-277.000.

Maury, Christian, to Bull S.A. Magnetic recording disc having sector reference zone, device for reading same, and magnetooptical memory optoelectronic employing said device. 4,984,901, Cl. 369-44.260.

Mawst, Luke J.: *See*—
Botez, Dan; Jansen, Michael; Mawst, Luke J.; Peterson, Gary L.; Simmons, William W.; Wilcox, Jaroslava Z.; and Yang, Jane J. J., 4,985,897, Cl. 372-50.000.

Mayama, Shinya: *See*—
Sasa, Nobumasa; Shimizu, Kunio; Watanabe, Manabu; Urano, Toshiyuki; Mayama, Shinya; and Masuda, Tetsuya, 4,985,337, Cl. 430-254.000.

Mayr, Ernst; and Oestreich, Ulrich, to Siemens Aktiengesellschaft. Method for manufacturing an optical cable. 4,985,185, Cl. 264-1.500.

Maytag Corporation: *See*—
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Maytaku System: *See*—
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Mayumi, Junji: *See*—
Nishio, Takeyoshi; Yamauchi, Shinichi; Arashiro, Yusuke; Ohno, Kenyu; Yokoyama, Masuzo; Nakano, Hiroshi; Ohmori, Hiroshi; Mayumi, Junji; and Kihira, Michiharu, 4,985,495, Cl. 525-68.000.

Mazda Motor Corporation: *See*—
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Nanba, Seiji, 4,984,538, Cl. 123-41.100.

Mazzullo, Raymond; and Van Zyl, Brian R., to Multitech Systems (Proprietary) Limited. Power supply structure. 4,985,806, Cl. 361-392.000.

McCall, James E., to Du Pont de Nemours, E. I., and Company. Yarn finish applicator with internal finish heating capability. 4,984,440, Cl. 68-200.000.

McCarthy, James P.: *See*—
Neilson, Diane H. R.; Work, Sara L. R.; Whaley, Edward L.; Kirkpatrick, Steven J.; and McCarthy, James P., 4,985,271, Cl. 426-595.000.

McConnell, Christopher F.; and Walter, Alan E., to CFM Technologies Research Associates. Apparatus for rinsing and drying surfaces. 4,984,597, Cl. 134-95.000.

McCoy-Ellison, Inc.: *See*—
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McCulloch, Charles R., to Explosive Research and Development Corporation. Melt cast explosives. 4,985,093, Cl. 149-19.400.

McCullough, Robert C. Lift apparatus. 4,984,955, Cl. 414-546.000.

McDonnell Douglas Corporation: *See*—
Cox, Ronald L., 4,984,347, Cl. 29-402.060.

McDougall, Ian L., to Oxford Magnet Technology Limited. Magnet assembly. 4,985,679, Cl. 324-318.000.

McGarry, Patrick J., to Mars Incorporated. Method and apparatus for retrofitting a standard coin operated telephone employing a carbon microphone with a line powered electronic controller. 4,985,910, Cl. 379-27.000.

McGee, John K.: *See*—
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McGuane Industries: *See*—
Rische, Kenneth L.; Affeldt, Roger D.; and Urbanek, Edward A., Jr., 4,984,542, Cl. 123-179.00G.

McIntosh, B. J.: *See*—
Altimier, David F., Jr.; and McIntosh, B. J., 4,985,917, Cl. 379-32.000.

McKean, Peter, to Holset Engineering Company Limited. Variable geometry turbine inlet wall mounting assembly. 4,984,965, Cl. 415-155.000.

McKeen, Francis X.: *See*—
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McNair, Rhett: *See*—
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McNeil-PPC, Inc.: *See*—
Lingertat, Arnold; and Swieringa, Morris K., 4,985,025, Cl. 604-390.000.

McNickle, William: *See*—
Lindsay, Robert J.; Bell, Rodney E.; and McNickle, William, 4,984,948, Cl. 412-1.000.

McNinch, Joseph H., Jr., to Eaton Corporation. Trailer mounted tractor-trailer brake control system. 4,984,852, Cl. 303-15.000.

Mead Corporation, The: *See*—
Yoshida, Noble H.; and Brabender, John, 4,985,484, Cl. 524-379.000.

Meckel, Walter: *See*—
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MED Institute, Inc.: *See*—
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Med-Safe Systems, Inc.: *See*—
Shillington, Richard A., 4,984,686, Cl. 206-366.000.

Medebach, Thomas: *See*—
Marscholl, Klaus; and Medebach, Thomas, 4,984,386, Cl. 49-352.000.

Meditor Corporation: *See*—
Hass, Robert D., Jr.; Hodder, Brian G.; and Yakymyshyn, Christopher P., 4,984,462, Cl. 73-293.000.

Medlock, Nancy P. Educational board game and method of playing the same. 4,984,805, Cl. 273-248.000.

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Mehner, Martin: *See*—
Wilkes, Lambert H.; Mehner, Martin; and Lalor, William F., 4,984,334, Cl. 19-48.00R.

Meiji Milk Products Company Limited: *See*—
Takahashi, Yasuyuki; Yoshida, Toshiro; and Takahashi, Takeshi, 4,985,173, Cl. 252-314.000.

Meiji Seika Kaisha, Ltd.: *See*—
Tsuruoka, Tsutomu; Nakabayashi, Satoru; Fukuyasu, Harumi; Ishii, Yuuko; Tsuruoka, Takashi; Yamamoto, Haruo; Inouye, Shigeharu; and Kondo, Shinichi, 4,985,445, Cl. 514-315.000.

Meinking, Terri L.: *See*—
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Meland, Ronald F.: *See*—
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Melco Industries, Inc.: *See*—
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Melzer, Andreas; Naruhn, Markus; Kipfmuller, Karl; Reidenbach, H. D.; and Buess, Gerd, to Richard Wolf GmbH. Bipolar coagulation instrument. 4,985,030, Cl. 606-51.000.

Mennen Company, The: *See*—
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Mercedes-Benz AG: *See*—
Leiber, Heinz; Ohnemuller, Hans; Kastner, Klaus; and Richter, Karl-Heinz, 4,984,649, Cl. 180-197.000.

Mercer, James C.: *See*—
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Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Eidenschink, Rudolf; Krause, Joachim; Wachtler, Andreas; Hittich, Reinhard; Scheuble, Bernhard; Weber, Georg; and Kurmeier, Hans-Adolf, 4,985,583, Cl. 558-431.000.

Merdes, Hartmut: *See*—
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Login, Robert B.; Merianos, John J.; Dandreaux, Gary; and Shih, Jenn S., 4,985,521, Cl. 526-264.000.

Merkle, Scott A., to Maytag Corporation. Coin drop assembly. 4,984,670, Cl. 194-317.000.

Merriam, Charles N.; Mallon, Charles B.; Harvey, James R.; and Johnson, Robert N., to Union Carbide Chemicals and Plastics Company Inc. Novel vinyl chloride resins and compositions incorporating such resins. 4,985,314, Cl. 428-694.000.

Merritt, Carleton G.: *See*—
Irvin, Scot A.; Fedor, Robert A.; and Merritt, Carleton G., 4,985,269, Cl. 426-560.000.

Mertens, Alfred: *See*—
Zilch, Harald; Mertens, Alfred; Von Der Saal, Wolfgang; Boehm, Erwin; and Strein, Klaus, 4,985,448, Cl. 514-339.000.

Mertens, Guy; Reydams, Jean-Jacques; and Wasterlain, Michel, to Glaverbel. Process for increasing resistance to penetration through a glazed opening. 4,985,099, Cl. 156-94.000.

Merz, Vernon R.: *See*—
Klug, David M.; and Merz, Vernon R., 4,985,263, Cl. 426-302.000.

Mesenich, Gerhard, to Coltec Industries Inc. Electromagnetic injection valve. 4,984,549, Cl. 123-472.000.

Messer Griesheim: *See*—
Zeiss, Karl R.; and Degen, Paul, 4,985,276, Cl. 427-136.000.

Messer Griesheim GmbH: *See*—
Endlweber, Hans, 4,985,039, Cl. 8-94.150.

Messerschmitt-Boelkow-Blohm GmbH: *See*—
Hofmann, Otto, 4,984,892, Cl. 356-372.000.
Schukat, Manfred, 4,985,706, Cl. 342-352.000.

Messier-Hispano-Bugatti: *See*—
Derrien, Michel, 4,984,755, Cl. 244-102.0SS.

Meszaros nee Brill, Judit M.: *See*—
Kreidl, Janos; Turcsanyi, Peter; Arcs nee Trischler, Zsuzsanna; Stefko, Bela; Meszaros nee Brill, Judit M.; Deutsch nee Juhasz, Ida; Szilbereky, Jeno; Csizer, Eva; and Vezer, Szilard, 4,985,463, Cl. 514-646.000.

Methfessel, Heinz: *See*—
Kim, Sang N.; Kroiss, Alfred; and Methfessel, Heinz, 4,984,821, Cl. 280-728.000.

Mettler, John H.; Johnson, William L.; Strickland, William C.; and Zaderej, Victor V., to Mint-Pac Technologies, Inc. Three dimensional plating or etching process and masks therefor. 4,985,116, Cl. 156-656.000.

Meyer, Gunter: *See*—
Maassen, Heinz; and Meyer, Gunter, 4,984,609, Cl. 139-449.000.

Meyer, Rolf-Volker: *See*—
Heinz, Hans-Detlef; Hansel, Eduard; Meyer, Rolf-Volker; and Arend, Gunter, 4,985,534, Cl. 528-272.000.
Mussig, Bernhard; Meyer, Rolf-Volker; Dhein, Rolf; and Brassat, Bert, 4,985,508, Cl. 525-420.500.

Meynier, Guy, to Bendix France. Multiple disc brake. 4,984,661, Cl. 188-71.500.

Meyrueix, Remi: *See*—
Mignani, Gerard; Barthelemy, Pascal; and Meyrueix, Remi, 4,985,528, Cl. 528-59.000.

Michaud, Philippe; and Prud'Homme, Christian, to Rhone-Poulenc Chimie. Preparation of thermally stable copolyimidoamides containing diorganopolysiloxane recurring units. 4,985,527, Cl. 528-26.000.

Michel, Thomas J., to G B Instruments, Inc. Direct transfer sorting system. 4,984,676, Cl. 198-365.000.

Michelson, Gary K. X-ray marker. 4,985,019, Cl. 604-180.000.

Mickle, Marlin H.: *See*—
Pulyer, Yuly M.; and Mickle, Marlin H., 4,985,691, Cl. 336-130.000.

Microelectronics and Computer Technology Corporation: *See*—
Nelson, Bradley H., 4,984,358, Cl. 29-830.000.

Micromation Systems, Inc.: *See*—
Reed, Herbert M.; Sager, Scott J.; Grebenyuk, Alexander; and Torchia, Stephen F., 4,984,352, Cl. 29-568.000.

Mid-America Scale, Inc.: *See*—
Skibinski, Robert E., 4,984,644, Cl. 177-132.000.

Midrex International BV, Rotterdam, Zurich Branch: *See*—
Hoffmann, Glenn E.; and Scarlett, John C., 4,985,068, Cl. 75-501.000.

Mifune, Hironobu: *See*—
Inada, Toshio; Ueda, Aki; Mifune, Hironobu; and Ogura, Yukio, 4,985,618, Cl. 250-208.100.

Mignani, Gerard; Barthelemy, Pascal; and Meyrueix, Remi, to Rhone-Poulenc Chimie. Novel nonlinearly optically active polyurethanes. 4,985,528, Cl. 528-59.000.

Mihayashi, Keiji: *See*—
Ichijima, Seiji; and Mihayashi, Keiji, 4,985,336, Cl. 430-223.000.

Mikami, Fumiyuki, to Canon Kabushiki Kaisha. Variable-length coding/decoding device. 4,985,700, Cl. 341-59.000.

Mikasa Seiyaku Co., Ltd.: *See*—
Shimizu, Keisuke; Matsumura, Takumi; and Nakamoto, Masato, 4,985,456, Cl. 514-467.000.

Miki, Tosaku; Asano, Masahide; and Hosokami, Toru, to Daiichi Pharmaceutical Co., Ltd. Aminobenzamide derivatives. 4,985,595, Cl. 564-157.000.

Mikulin, Joseph F., to Du Pont de Nemours, E. I., and Company. Film box. 4,984,688, Cl. 206-455.000.

Mikuni Kogyo Kabushiki Kaisha: *See*—
Muraji, Tetsuo, 4,984,547, Cl. 123-463.000.

Miley, John W.; and Rekers, John W., to Milliken Research Corporation. Polyoxylalkylene amino diol substituted colorants. 4,985,546, Cl. 534-729.000.

Millar, Ross W.; Paul, Norman C.; and Richards, David H., to Secretary of State for Defence. Process for the production of high energy materials. 4,985,584, Cl. 558-483.000.

Miller, Charles A.: *See*—
Beamenderfer, Robert E.; Buchheister, Raymond R., Jr.; Ellis, John R.; Miller, Charles A.; Moist, Stanford C., Jr.; and Zelko, William E., 4,984,992, Cl. 439-108.000.

Miller, Norman P.; and Eaton, Leo W., to ABB Air Preheater, Inc. Element basket assembly for heat exchanger. 4,984,621, Cl. 165-10.000.

Millichip, Robyn J., to University of Queensland. Ethanol production by zymomonas cultured in yeast-conditioned media. 4,985,355, Cl. 435-42.000.

Milliken Research Corporation: *See*—
Miley, John W.; and Rekers, John W., 4,985,546, Cl. 534-729.000.
Riddle, Dennis L., 4,985,095, Cl. 156-064.000.

Millis, David B.: *See*—
Aldrich, Gary R.; Brown, George T.; Millis, David B.; and Nowak, Ronald P., 4,985,855, Cl. 364-522.000.

Milwaukee School of Engineering: *See*—
Ottman, Rick; Wiberg, Don; Johnson, Jack; Wanke, Thomas S.; and Davis, Thomas W., 4,984,989, Cl. 434-401.000.

Mima, Toshiyuki: *See*—
Seike, Shoji; Mima, Toshiyuki; and Mori, Koichi, 4,984,860, Cl. 350-96.100.

Minagawa, Fumiyasu: *See*—
Kohama, Takuji; Minagawa, Fumiyasu; Shinjo, Goro; and Maeda, Kazuyuki, 4,985,413, Cl. 514-79.000.

Minai, Masayoshi; and Higashi, Takayuki, to Sumitomo Chemical Company, Limited. Optically active benzene derivatives and process for preparation thereof. 4,985,590, Cl. 560-184.000.

Minami International Corp.: *See*—
Nagai, Toshio, 4,985,001, Cl. 439-527.000.

Minami, Shunji: *See*—
Yamada, Wataru; Kido, Yukio; Abe, Hiroyuki; Minami, Shunji; Katoh, Shigeru; and Yano, Junro, 4,985,878, Cl. 368-88.000.

Minami, Takashi, to 501 Toyota Jidosha Kabushiki Kaisha. Exhaust gas purifying apparatus for automobile. 4,985,210, Cl. 422-169.000.

Minami, Yoshitaka: *See*—
Kakumaru, Hajime; Minami, Yoshitaka; Kubota, Naohiro; and Mashimo, Shinya, 4,985,564, Cl. 546-104.000.

Minatono, Shobu: *See*—
Nishikawa, Makoto; Takamatsu, Hideo; Ishii, Masao; and Minatono, Shobu, 4,985,499, Cl. 525-89.000.

Mindermann, Kurt-Henry; and Wintrich, Franz. Technique for controlling the combustion of fuel having fluctuating thermal values. 4,984,524, Cl. 110-346.000.

Mine, Katsutoshi: *See*—
Muramoto, Naohiro; and Mine, Katsutoshi, 4,985,342, Cl. 430-280.000.

Mine, Kenji: *See*—
Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 4,984,826, Cl. 285-101.000.

Minematsu, Yoshihiro: *See*—
Yano, Shinji; Kawamata, Akira; Minematsu, Yoshihiro; Akazaki, Shuichi; Zama, Mitsuko; Imokawa, Genji; Takaishi, Naotake; Ohtomo, Tsuyoshi; and Komori, Takashi, 4,985,547, Cl. 536-4.100.

Ministry of International Trade & Industry: *See*—
Abe, Takashi; and Hayashi, Eiji, 4,985,556, Cl. 540-484.000.
Enomoto, Yuji, 4,984,453, Cl. 73-81.000.

Minnesota Mining and Manufacturing: *See*—
Croft, Thomas S.; and Haugen, Hartwick, 4,985,475, Cl. 523-173.000.
Douden, David K., 4,985,380, Cl. 501-128.000.

Minnesota Mining and Manufacturing Company: *See*—
Bjork, Jon A., 4,985,392, Cl. 503-211.000.
Buckley, Lee A.; and Insley, Thomas I., 4,985,298, Cl. 428-288.000.
Chou, Hsin-Hsin; Lamanna, William M.; and Wright, Robin E., 4,985,321, Cl. 430-38.000.
Clausen, Earl W.; and Hubbard, Lloyd C., 4,984,972, Cl. 417-420.000.
Landin, Donald T., 4,985,488, Cl. 524-555.000.
Lee, Nicholas A.; and Toonen, James E., 4,984,865, Cl. 350-96.200.
Palazzotto, Michael C.; and DeVoe, Robert J., 4,985,340, Cl. 430-270.000.
Rossman, Mitchell A.; and Bonham, James A., 4,985,562, Cl. 544-209.000.
Sipinen, Alan J., 4,985,024, Cl. 604-389.000.
Tengler, John N.; and Gobets, Roy A., 4,985,000, Cl. 439-497.000.
Williams, Brian Howard; and Young, Chung-I, 4,985,473, Cl. 522-89.000.

Mino, Norihisa, to Matsushita Electric Industrial Co., Ltd. Method of producing fine inorganic particles. 4,985,273, Cl. 427-35.000.

Minolta Camera Kabushiki Kaisha: *See*—
Egawa, Takeshi; Nakai, Masaaki; Nakanishi, Yasuo; Ishimura, Toshihiko; Nishimura, Shinichi; Tsuji, Sadafusa; and Ishibashi, Kenji, 4,985,723, Cl. 354-400.000.
Hata, Kazuyoshi; and Tanaka, Masami, 4,984,876, Cl. 350-423.000.
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 4,985,774, Cl. 358-213.190.
Kuroda, Muneo, 4,984,858, Cl. 350-6.800.

Mint-Pac Technologies, Inc.: *See*—
Mettler, John H.; Johnson, William L.; Strickland, William C.; and Zaderej, Victor V., 4,985,116, Cl. 156-656.000.

Mirassou, Alfred: *See*—
Arretz, Emmanuel; Auge, Patrick; Mirassou, Alfred; and Landoussy, Claude, 4,985,586, Cl. 560-18.000.

Misaki, Jun: *See*—
Takahashi, Yoshinori; Misaki, Jun; and Karaki, Takayuki, 4,984,512, Cl. 99-327.000.

Mishimoto, Tetsuo: *See*—
Inagaki, Yoshihiro; Yamamoto, Hideo; and Mishimoto, Tetsuo, 4,984,497, Cl. 84-626.000.

Mission Pharmacal Company, Inc.: *See*—
Walsdorf, Neill B.; and Alexandrides, George, 4,985,593, Cl. 562-584.000.

Mitani, Takahiko: *See*—
Sawai, Kiichi; Takeda, Jun; Seino, Yutaka; Imura, Hiroo; Tanaka, Kenichi; Takahashi, Haruo; Mitani, Takahiko; and Kurono, Masayasu, 4,985,356, Cl. 435-69.400.

Mitchell, James W., to Monsanto Company. Prolonged release of biologically active polypeptides. 4,985,404, Cl. 514-6.000.

Mitchell, Paul, to ENM Company. Engine operating time hour meter. 4,985,875, Cl. 368-5.000.

Mitsubishi Chemical Industries Limited: *See*—
Miura, Konoe; Ozawa, Tetsuo; and Kanaya, Junko, 4,985,171, Cl. 352-299.100.

Mitsubishi Denki Ka bushiki Kaisha: *See*—
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,984,552, Cl. 123-492.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujioka, Takashi; and Yamanouchi, Masahide, 4,985,753, Cl. 357-80.000.
Ishii, Tatsuya; Okumura, Yoshinori; and Nagatomo, Masao, 4,985,368, Cl. 437-038.000.
Isozumi, Shuzoo, 4,985,637, Cl. 290-48.000.
Kadowaki, Yoshinobu; and Yoshii, Yutaka, 4,985,689, Cl. 333-101.000.
Kako, Hajime; and Kojima, Shinji, 4,984,553, Cl. 123-494.000.
Kaneyuki, Kazutoshi; and Iwatani, Shiro, 4,985,670, Cl. 322-28.000.
Kato, Hisao, 4,984,959, Cl. 414-744.300.

Kato, Naoki; Tsukahara, Toshiro; Yanaura, Satoshi; and Haraga, Kousuke, 4,985,794, Cl. 360-107.000.
Kotani, Genzaburou, 4,985,843, Cl. 364-483.000.
Mori, Haruyoshi; and Sashida, Nobuo, 4,985,819, Cl. 363-37.000.
Morikane, Hiroyuki, 4,985,654, Cl. 310-249.000.
Morishita, Hiroaki; Aramaki, Jun; and Tomisawa, Masao, 4,985,608, Cl. 219-69.120.
Morishita, Mitsuharu; Uota, Kosaku; and Yasukawa, Takeshi, 4,984,647, Cl. 180-79.100.
Nagayama, Yasuji; and Ozaki, Atsushi, 4,985,641, Cl. 307-272.300.
Nakamura, Hisashi; and Fukumoto, Hiroshi, 4,985,711, Cl. 346-76.0PH.
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,984,552, Cl. 123-492.000.
Nomura, Masami, 4,984,659, Cl. 187-108.000.
Okihara, Yoshihiko; and Arita, Yutaka, 4,985,644, Cl. 307-443.000.
Onishi, Masayoshi; and Ozawa, Hiromasa, 4,984,668, Cl. 192-84.00C.
Shimomura, Setsuhiro; Wataya, Seiji; Nishimura, Yukinobu; and Okubo, Satoru, 4,984,546, Cl. 123-425.000.
Suga, Hideoki, 4,985,894, Cl. 371-16.500.
Togane, Hikohiro, 4,985,167, Cl. 252-62.580.
Tsuruoka, Toshiaki; Nakamura, Masafumi; and Mori, Shintaro, 4,985,648, Cl. 307-456.000.
Watakabe, Yaichiro; Okamoto, Tatsuo; and Matsuda, Shuichi, 4,985,319, Cl. 430-5.000.
Watanabe, Hidetaka; and Fukunaga, Kanji, 4,985,884, Cl. 369-263.000.
Yasui, Katsuaki; Tada, Yasuo; and Takashima, Akira, 4,984,466, Cl. 73-721.000.
Yoshioka, Kazuo, 4,984,887, Cl. 350-332.000.

Mitsubishi Electronics America, Inc.: *See*—
Emmons, Lawrence D.; Mackley, James S.; Stokes, David H.; Stefenel, Rudolph S.; Brisko, William E., Jr.; and Cooper-Hart, Michael A., 4,985,911, Cl. 379-53.000.

Mitsubishi Gas Chemical Co., Inc.: *See*—
Saito, Masao; Tsukahara, Kengo; Takahashi, Noriko; and Onda, Yuzi, 4,985,581, Cl. 558-327.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,836, Cl. 364-426.020.
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,838, Cl. 364-426.020.
Hiramatsu, Takeo; and Tanaka, Yuichi, 4,984,483, Cl. 74-866.000.
Togai, Kazuhide; and Shimada, Makoto, 4,985,837, Cl. 364-426.020.

Mitsubishi Kasei Corporation: *See*—
Himeno, Kiyoshi; Hihara, Toshio; Shimizu, Kanzi; and Shimizu, Yukiharu, 4,985,545, Cl. 534-618.000.
Kawakami, Tetsuji; Imai, Akihiro; Taguchi, Nobuyoshi; Murata, Yukichi; and Hirota, Takao, 4,985,396, Cl. 503-227.000.
Morita, Shuji; Saito, Ken-Ichi; Ninomiya, Kunihiro; Tobe, Akihiro; Nitta, Issei; and Sugano, Mamoru, 4,985,430, Cl. 514-253.000.
Nagasaka, Hideki; and Takahashi, Noriaki, 4,985,470, Cl. 522-26.000.
Sasa, Nobumasa; Shimizu, Kunio; Watanabe, Manabu; Urano, Toshiyuki; Mayama, Shinya; and Masuda, Tetsuya, 4,985,337, Cl. 430-254.000.

Mitsubishi Kenki Kabushiki Kaisha: *See*—
Ikejima, Satomi; and Iwata, Shigemi, 4,984,660, Cl. 187-134.000.

Mitsubishi Metal Corporation: *See*—
Yato, Tadao; and Tanaka, Hiroshi, 4,985,183, Cl. 264-0.500.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Horie, Shinji; Shimizu, Hideto; Ohmori, Michio; and Yui, Hiroshi, 4,984,326, Cl. 15-256.500.
Matsuura, Mitsuyuki; and Fujita, Takashi, 4,985,515, Cl. 526-125.000.
Nishio, Takeyoshi; Yamauchi, Shinichi; Arashiro, Yusuke; Ohno, Kenyu; Yokoyama, Masuzo; Nakano, Hiroshi; Ohmori, Hiroshi; Mayumi, Junji; and Kihira, Michiharu, 4,985,495, Cl. 525-68.000.
Seo, Iwao; Nakajima, Kenji; and Kishimoto, Manabu, 4,985,179, Cl. 252-587.000.
Takahashi, Kunimasa; Kameda, Takashi; Yoshikawa, Masato; and Teranishi, Teruo, 4,985,184, Cl. 264-6.000.

Mitsubishi Rayon Company, Ltd.: *See*—
Aosai, Fumito; Fukushima, Hiroshi; and Hado, Hisako, 4,985,472, Cl. 522-64.000.
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,984,859, Cl. 350-96.240.
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Ishii, Kazuhiro, 4,985,592, Cl. 562-534.000.
Kishida, Kazuo; Kitai, Kiyokazu; and Mohri, Masaaki, 4,985,496, Cl. 525-74.000.
Kushi, Kenji; Inukai, Ken-ichi; Iseki, Takayuki; and Fujimoto, Yasuyuki, 4,985,343, Cl. 430-285.000.

Mitsuda, Satoshi; Matsuo, Noritada; and Hirohara, Hideo, to Sumitomo Chemical Company, Ltd. Process for producing optically active benzyl alcohol compound. 4,985,365, Cl. 435-280.000.

Mitsuhashi, Yasuo: *See*—
Sakashita, Kiichiro; Tanikawa, Hirohide; Yoshida, Satoshi; Nakahara, Toshiaki; Matsushige, Naoki; Fujiwara, Masatsugu; and Mitsuhashi, Yasuo, 4,985,327, Cl. 430-106.600.

Mitsui Petrochemical Industries, Ltd.: *See*—
Kameyama, Masao; and Kumagawa, Shigeyuki, 4,985,478, Cl. 523-219.000.
Sakashita, Takeshi; Arata, Masami; and Yamamoto, Takashi, 4,985,516, Cl. 526-196.000.

Mitsui Toatsu Chemicals Incorporated: *See*—
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizou, 4,985,362, Cl. 435-226.000.
Nakayama, Shigenobu; and Ikeda, Fumiaki, 4,985,458, Cl. 514-533.000.
Ooe, Takashi; Ogawa, Shinji; Miura, Akiko; and Itatani, Ryohei, 4,985,213, Cl. 422-186.010.

Mitsunaga, Takafumi: *See*—
Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, 4,985,444, Cl. 514-300.000.

Mitytoyo Corporation: *See*—
Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, 4,985,623, Cl. 250-231.160.

Miura, Akiko: *See*—
Ooe, Takashi; Ogawa, Shinji; Miura, Akiko; and Itatani, Ryohei, 4,985,213, Cl. 422-186.010.

Miura, Kenji: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,573, Cl. 549-402.000.
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,574, Cl. 549-402.000.

Miura, Konoe; Ozawa, Tetsuo; and Kanaya, Junko, to Mitsubishi Chemical Industries Limited. Anthraquinone type compound and liquid crystal composition containing such compound. 4,985,171, Cl. 352-299.100.

Miyadera, Yasuo: *See*—
Matuura, Hidekazu; Miyadera, Yasuo; and Kato, Toshihiko, 4,985,509, Cl. 525-426.000.

Miyagi, Yoshio: *See*—
Komine, Hidemi; and Miyagi, Yoshio, 4,985,713, Cl. 346-82.000.

Miyahara, Osamu: *See*—
Ishiguro, Masaji; Iwata, Hiromitsu; Nakatsuka, Takashi; Nakayama, Kiyoharu; Miyahara, Osamu; and Noguchi, Kenichi, 4,985,575, Cl. 549-484.000.

Miyakawa, Hiroshi: *See*—
Okonogi, Shigeo; Tomita, Mamoru; Shimamura, Seiichi; Tomimura, Toshio; Ishibashi, Norio; Miyakawa, Hiroshi; and Sugawara, Koichi, 4,985,246, Cl. 424-115.000.

Miyakawa, Naohisa; and Kato, Katuhisa, to Tokiwa Chemical Industries Co., Ltd. Front glass moulding for vehicle. 4,984,839, Cl. 296-93.000.

Miyake, Sanae: *See*—
Kasai, Masaaki; Yamazaki, Sakae; and Miyake, Sanae, 4,985,026, Cl. 604-403.000.

Miyake, Yasuo: *See*—
Kakimoto, Fumio; Asakawa, Naoki; Ishibashi, Yasuo; and Miyake, Yasuo, 4,985,245, Cl. 424-94.300.

Miyamoto, Eiji, to Hitachi, Ltd. Semiconductor memory device with an improved substrate back-bias arrangement. 4,985,869, Cl. 365-226.000.

Miyano, Hitoshi, to Fuji Photo Optical Co., Ltd. Ojective lens for endoscope. 4,984,878, Cl. 350-469.000.

Miyata, Souichi: *See*—
Matsumoto, Satoshi; Azuma, Daisuke; and Miyata, Souichi, 4,985,890, Cl. 370-94.100.

Miyata, Takeo: *See*—
Furuya, Nobuaki; Ono, Takuhiro; Horiuchi, Naoya; Yamanaka, Keiichro; and Miyata, Takeo, 4,985,898, Cl. 372-106.000.

Miyauchi, Fumio: *See*—
Sugiura, Takashi; Matsuura, Ichiro; Miyauchi, Fumio; and Chiyoshi, Toyoharu, 4,985,189, Cl. 264-26.000.

Miyawaki, Toshi: *See*—
Mori, Kazuhiko; Ishii, Hitoshi; and Miyawaki, Toshi, 4,985,087, Cl. 148-273.000.

Miyazaki, Chuuichi; Akatsu, Toshio; and Mori, Sadao, to Hitachi, Ltd. Laser gauge interferometer and locating method using the same. 4,984,891, Cl. 356-358.000.

Miyazaki, Jingo: *See*—
Kuwabara, Tsuneo; and Miyazaki, Jingo, 4,984,811, Cl. 277-3.000.

Miyazaki, Masaaki: *See*—
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,984,552, Cl. 123-492.000.

Miyazawa, Kiyoshi: *See*—
Chiba, Tadahiro; Miyazawa, Kiyoshi; Uzuka, Makoto; and Suzuki, Takashi, 4,985,425, Cl. 514-222.200.

Miyazawa, Takeshige: *See*—
Wada, Nobuhide; Saito, Yoshihiro; Kusano, Shoji; Toyokawa, Yasuhumi; Miyazawa, Takeshige; Kajiwara, Ikuo; and Takahashi, Satoru, 4,985,066, Cl. 71-92.000.

Miyoshi, Takeshi: *See*—
Matsuno, Kazuhiro; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, 4,985,237, Cl. 424-59.000.

Mizandjian, Jean-Luc: *See*—
Duboc, Soraya; Renon, Henri; Laugier, Serge; Mizandjian, Jean-Luc; and Pean, Jean-Louis, 4,985,265, Cl. 426-425.000.
Mizuhara, Noboru; and Kuroyanagi, Kansuke, to Thomson Composants Microondes. Systems for selecting a transmission control procedure in communications using integrated services digital networks. 4,985,887, Cl. 370-58.200.
Mizuno, Isao: *See*—
Suzuki, Hiromi; Suzuki, Eiiti; and Mizuno, Isao, 4,984,394, Cl. 51-165.900.
Mizuno, Kuniharu: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,573, Cl. 549-402.000.
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,574, Cl. 549-402.000.
Mizuno, Tomokimi: *See*—
Momose, Yutaka; Watanabe, Tetsumi; Hiraiwa, Kouzi; and Mizuno, Tomokimi, 4,984,428, Cl. 60-517.000.
Wada, Yoshiaki; Itaba, Tunesaku; Kasahara, Koichiro; Mizuno, Tomokimi; and Momose, Yutaka, 4,984,812, Cl. 277-153.000.
Mizuno, Toshiya: *See*—
Iizuka, Yo; Kashiwadate, Ken; Hosokawa, Toshio; Endo, Shunzo; Katto, Takayuki; Mizuno, Toshiya; and Katase, Kenichi, 4,985,512, Cl. 525-537.000.
Mizushina, Fumio; Goto, Takashi; and Maruki, Toshimitsu, to Kabushiki Kaisha Meidensha. Simulated engine characteristic control system. 4,984,988, Cl. 434-380.000.
Mizutani, Tomoji: *See*—
Isozaki, Hideo; Mizutani, Tomoji; and Sakamoto, Yoshihiro, 4,985,197, Cl. 264-564.000.
ML Technology Ventures, L.P.: *See*—
Faulds, Daryl H.; and Vishoot, Mimi, 4,985,243, Cl. 424-85.800.
Mlynko, Walter E.: *See*—
Egitto, Frank D.; and Mlynko, Walter E., 4,985,112, Cl. 156-643.000.
Mobay Corporation: *See*—
Rosthauser, James W.; Meckel, Walter; and Rasshofer, Werner, 4,985,490, Cl. 524-871.000.
Mobil Oil Corporation: *See*—
Ashjian, Henry; and Gawel, Henry A., 4,985,156, Cl. 252-49.600.
Audeh, Costandi A., 4,985,137, Cl. 208-251.00H.
Audeh, Costandi A.; and Greco, Saverio G., 4,985,220, Cl. 423-240.000.
Audeh, Costandi A., 4,985,389, Cl. 502-516.000.
Chu, Pochen; Herbst, Joseph A.; Klocke, Donald J.; and Vartuli, James, 4,985,223, Cl. 423-328.000.
Cullick, Alvin S.; and Hazlett, Randy D., 4,984,635, Cl. 166-261.000.
Derr, W. Rodman, Jr.; Owens, Peter J.; and Sarli, Michael S., 4,985,134, Cl. 208-89.000.
Farng, Liehpao O.; Horodysky, Andrew G.; Ernhoffer, Robert E.; and Keller, John A., Jr., 4,985,157, Cl. 252-49.600.
Gunesin, Binnur Z.; and Pindris, Paul A., 4,985,505, Cl. 525-250.000.
Sapre, Ajit V., 4,985,133, Cl. 208-78.000.
Shirodkar, Pradeep P., 4,985,498, Cl. 525-86.000.
Tabak, Samuel A., 4,985,203, Cl. 422-190.000.
Mochizuki, Akira; Sato, Yoshio; Ogawara, Hisashi; and Yamashita, Syuzo, to Agency of Industrial Science and Technology. Liquid separation membrane for pervaporation. 4,985,147, Cl. 210-500.270.
Mochizuki, Hidehiro: *See*—
Uemura, Hiroyuki; Suzuki, Akira; Shimada, Masaru; Mochizuki, Hidehiro; and Morohoshi, Naoya, 4,985,397, Cl. 503-227.000.
Mochizuki, Kiyohumi: *See*—
Ryu, Shiro; Mochizuki, Kiyohumi; and Horiuchi, Yukio, 4,984,884, Cl. 356-73.100.
Mochizuki, Manabu: *See*—
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Tsuruoka, Ichiro; Takenouchi, Hiroaki; and Echigo, Katsuhiro, 4,985,733, Cl. 355-282.000.
Mochizuki, Shuji; Okuma, Atsushi; and Haruna, Katsunori, to Three Bond Co., Ltd. Anaerobically curing adhesive sealing composition. 4,985,523, Cl. 526-301.000.
Moggi, Giovanni; Ingoglia, Desiderata; and Lenti, Daria, to Ausimont S.r.l. Process for protecting and consolidating stony materials. 4,985,282, Cl. 427-393.000.
Mohara, Masayuki; and Kano, Yoshinori, to Sanyo Electric Co., Ltd. Electronic parts mounting apparatus. 4,984,354, Cl. 29-740.000.
Mohr, Dieter: *See*—
Rode, Klaus; Mohr, Dieter; Frass, Werner; and Gersdorf, Joachim, 4,985,341, Cl. 430-287.000.
Mohri, Masaaki: *See*—
Kishida, Kazuo; Kitai, Kiyokazu; and Mohri, Masaaki, 4,985,496, Cl. 525-74.000.
Moir, Michael B., to Seagate Technology, Inc. Disk drive spindle motor with externally mounted flux concentrator ring. 4,985,792, Cl. 360-99.080.
Moist, Stanford C., Jr.: *See*—
Beamenderfer, Robert E.; Buchheister, Raymond R., Jr.; Ellis, John R.; Miller, Charles A.; Moist, Stanford C., Jr.; and Zelko, William E., 4,984,992, Cl. 439-108.000.
Molodan, Oleg I.: *See*—
Kozachevsky, Gennady G.; Boikov, Vladimir P.; Guskov, Valery V.; Molodan, Oleg I.; Sizova, Svetlana I.; and Gorodnichev, Jury N., 4,984,976, Cl. 425-35.000.
Momose, Yutaka; Watanabe, Tetsumi; Hiraiwa, Kouzi; and Mizuno, Tomokimi, to Aisin Seiki Kabushiki Kaisha. Stirling engine. 4,984,428, Cl. 60-517.000.
Momose, Yutaka: *See*—
Wada, Yoshiaki; Itaba, Tunesaku; Kasahara, Koichiro; Mizuno, Tomokimi; and Momose, Yutaka, 4,984,812, Cl. 277-153.000.
Mondello, Frank J.: *See*—
Johnson, Bruce F.; and Mondello, Frank J., 4,985,589, Cl. 560-130.000.
Monobe, Hisanobu: *See*—
Akiyama, Setsuo; Monobe, Hisanobu; Naito, Kazuo; Honda, Toshio; and Tanaka, Kazuo, 4,985,510, Cl. 525-427.000.
Monsanto Company: *See*—
Mitchell, James W., 4,985,404, Cl. 514-6.000.
Udipi, Kishore, 4,985,501, Cl. 525-173.000.
Montedison S.p.A: *See*—
Bianchi, Daniele; Cesti, Pietro; and Golini, Paolo, 4,985,366, Cl. 435-280.000.
Montedison S.p.A.: *See*—
Coassolo, Alfredo; Chapoy, L. Lawrence; Foa, Marco; and Sabarino, Giampiero, 4,985,533, Cl. 528-193.000.
Monteith, Joseph G., to Fibresep Ltd. Improved separator tank construction. 4,985,148, Cl. 210-519.000.
Montes, Leopoldo F. Method and composition for treating vitiligo. 4,985,443, Cl. 514-249.000.
Montgomery, John A.: *See*—
Secrist, John A., III; Montgomery, John A.; Ealick, Steve E.; Erion, Mark D.; and Guida, Wayne C., 4,985,433, Cl. 514-258.000.
Secrist, John A., III; Montgomery, John A.; Ealick, Steve E.; Erion, Mark D.; and Guida, Wayne C., 4,985,434, Cl. 514-248.000.
Montgomery, Robert M.; Dessert, Robert A.; and Punater, Dinesh G., to A.M. International, Inc. System for measuring the relaxed length of a moving web. 4,984,458, Cl. 73-159.000.
Moon, Byungmoon, to New Tech Co., Ltd. Film change bag. 4,985,721, Cl. 354-308.000.
Moore, Steven W. Adjustable cup holder. 4,984,722, Cl. 224-42.430.
Moore, W. Gerald; and Webster, Nancy W., to Fieldcrest Cannon, Inc. Terry fabrics with tucks and method of making. 4,984,606, Cl. 139-25.000.
Moran, Stephen G.: *See*—
Lindsey, Edgar F.; and Moran, Stephen G., 4,984,639, Cl. 173-100.000.
Mori, Haruyoshi; and Sashida, Nobuo, to Mitsubishi Denki Kabushiki Kaisha. AC-DC-AC apparatus having battery charging and discharging feature. 4,985,819, Cl. 363-37.000.
Mori, Kazuhiko; Ishii, Hitoshi; and Miyawaki, Toshi, to Nihon Parkerizing Co., Ltd. Treating zinciferous metal surfaces to blacken them. 4,985,087, Cl. 148-273.000.
Mori, Kazushige: *See*—
Noguchi, Michio; Mori, Kazushige; Higashino, Nobuo; and Sunada, Motoki, 4,984,957, Cl. 414-723.000.
Mori, Kei. Light radiator for the cultivation of fish. 4,984,862, Cl. 350-96.100.
Mori, Kei. Light reflecting device with symmetrically disposed light reflecting plates. 4,984,880, Cl. 350-616.000.
Mori, Keiichi: *See*—
Nakano, Masao; Mori, Keiichi; Hiraiwa, Yoshitaka; Iizuka, Shoji; Shima, Shozo; and Nakamura, Yukio, 4,984,904, Cl. 374-139.000.
Mori, Koichi: *See*—
Seike, Shoji; Mima, Toshiyuki; and Mori, Koichi, 4,984,860, Cl. 350-96.100.
Mori, Kouji: *See*—
Moriizumi, Shuichi; Masuhara, Kenichi; Yamabe, Hidetoshi; Tomosue, Takao; Mori, Kouji; and Kaneko, Hisaharu, 4,985,104, Cl. 156-244.110.
Mori, Kunizou: *See*—
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizou, 4,985,362, Cl. 435-226.000.
Mori, Mikio. Work cutting attachment for zigzag sewing machines. 4,984,525, Cl. 112-128.000.
Mori, Sadao: *See*—
Miyazaki, Chuuichi; Akatsu, Toshio; and Mori, Sadao, 4,984,891, Cl. 356-358.000.
Mori, Satoshi: *See*—
Okada, Osamu; Takami, Susumu; Kotani, Tamotu; Mori, Satoshi; Fujita, Hiroki; Fukumura, Naoko; and Ippommatsu, Masamichi, 4,985,074, Cl. 75-444.000.
Mori, Shintaro: *See*—
Tsuruoka, Toshiaki; Nakamura, Masafumi; and Mori, Shintaro, 4,985,648, Cl. 307-456.000.
Mori, Tatsuya: *See*—
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Yano, Toshihiko; Fujimoto, Izumi; and Takada, Yoji, 4,985,460, Cl. 514-594.000.

Mori, Yasutomo; and Kurisu, Norio, to Ricoh Company, Ltd. Thermosensitive recording material. 4,985,394, Cl. 503-226.000.
Mori, Yoshiaki; Fujino, Masaru; Takagi, Hiroshi; and Sakabe, Yukio, to Murata Manufacturing Co., Ltd. Dielectric ceramic composition. 4,985,381, Cl. 501-136.000.
Moriguchi, Naoki: *See*—
Asada, Toshiyuki; Higashiyama, Yasuhiko; Nakawaki, Yasunori; Suzuki, Toshitake; Abe, Akiharu; and Moriguchi, Naoki, 4,985,011, Cl. 475-278.000.
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizou, to Mitsui Toatsu Chemicals Incorporated. Process of purifying tPA. 4,985,362, Cl. 435-226.000.
Morii, Noriko: *See*—
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizou, 4,985,362, Cl. 435-226.000.
Moriizumi, Shuichi; Mzsuhara, Kenichi; Yamabe, Hidetoshi; Tomosue, Takao; Mori, Kouji; and Kaneko, Hisaharu, to Lonseal Corporation; and Nissin Steel Company Ltd. Method of manufacturing a vinyl chloride-coated metal sheet. 4,985,104, Cl. 156-244.110.
Morikane, Hiroyuki, to Mitsubishi Denki Kabushiki Kaisha. Brush device for a motor. 4,985,654, Cl. 310-249.000.
Morikawa, Koji, to Fuji Jukogyo Kabushiki Kaisha. Fuel injection control system for a two-cycle engine. 4,984,540, Cl. 123-73.00C.
Morinaga Milk Industry Co., Ltd.: *See*—
Okonogi, Shigeo; Tomita, Mamoru; Shimamura, Seiichi; Tomimura, Toshio; Ishibashi, Norio; Miyakawa, Hiroshi; and Sugawara, Koichi, 4,985,246, Cl. 424-115.000.
Morishita, Hiroaki; Aramaki, Jun; and Tomisawa, Masao, to Mitsubishi Denki Kabushiki Kaisha. Method of positioning a wire electrode and a workpiece relative to each other in a wire cut electric discharge machine. 4,985,608, Cl. 219-69.120.
Morishita, Mitsuharu; Uota, Kosaku; and Yasukawa, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Electric power steering apparatus. 4,984,647, Cl. 180-79.100.
Morita, Shuji; Saito, Ken-Ichi; Ninomiya, Kunihiro; Tobe, Akihiro; Nitta, Issei; and Sugano, Mamoru, to Mitsubishi Kasei Corporation. 9-acylamino-tetrahydroacridine derivatives and memory enhancing agent containing said derivative as active ingredient. 4,985,430, Cl. 514-253.000.
Morizane, Toshinori; and Tokushima, Tadao. Base plate for recording disc and a method for its manufacture. 4,985,306, Cl. 428-410.000.
Morohoshi, Naoya: *See*—
Uemura, Hiroyuki; Suzuki, Akira; Shimada, Masaru; Mochizuki, Hidehiro; and Morohoshi, Naoya, 4,985,397, Cl. 503-227.000.
Morris, Brian G., to United States of America, National Aeronautics and Space Administration. Tank gauging apparatus and method. 4,984,457, Cl. 73-149.000.
Morrison, David G.; Heron, Andrew P.; and Beaumont, David O., to British Telecommunications public limited company. Video coder. 4,985,766, Cl. 358-133.000.
Morrison Molded Fiber Glass Company: *See*—
Brown, Gordon L., Jr., 4,985,101, Cl. 156-154.000.
Morrison, Philip W., Jr.; Solomon, Peter R.; and Hamblen, David G., to Advanced Fuel Research, Inc. Method and apparatus for temperature determination. 4,985,858, Cl. 364-557.000.
Mortimer, William P., Jr., to W. L. Gore & Associates, Inc. Polytetrafluoroethylene film. 4,985,296, Cl. 428-220.000.
Moser, Mark D.; Lawson, R. J.; Wang, Li; Parulekar, Vivekanand; Peer, Roger L.; and Hamlin, Charles R., to UOP. Multizone catalytic reforming process. 4,985,132, Cl. 208-65.000.
Moser, Winfried, to Robert Bosch GmbH. Method and device for lambda control with a plurality of probes. 4,984,551, Cl. 123-489.000.
Moshier, William C.; Brupbacher, John M.; Christodoulou, Leontios; and Nagle, Dennis C., to Martin Marietta Corporation. Process for forming porous metal-second phase composites. 4,985,202, Cl. 420-590.000.
Moss, Gaylord E.; and Wreede, John E., to Hughes Aircraft Company. Holographic exposure system to reduce spurious hologram noise. 4,984,856, Cl. 350-3.670.
Moteni, Roberto, to U.S. Philips Corporation. Dental X-ray apparatus for panoramic tomography. 4,985,907, Cl. 378-139.000.
Motoe, Hisafumi; Tokuhara, Masaharu; and Hoshino, Takaya, to Sony Corporation. Time-division bit number conversion circuit. 4,985,701, Cl. 341-61.000.
Motono, Masahiro, to Sansho Seiyaku Co., Ltd. External preparations free of discoloration. 4,985,455, Cl. 514-460.000.
Motorola, Inc.: *See*—
Davidson, Robert P.; and Rose, Richard A., 4,985,686, Cl. 330-124.00R.
Foster, Richard G., 4,985,926, Cl. 381-77.000.
Jentz, Bradley F.; and Yester, Francis R., 4,985,684, Cl. 329-327.000.
Mount, Gordon L.; and Cuny, James N., to Carrier Corporation. High efficiency purge system. 4,984,431, Cl. 62-85.000.
Moving Magnet Technologies S.A.: *See*—
Oudet, Claude; and Prudham, Daniel, 4,985,652, Cl. 310-15.000.
Mowka, Edmund J., Jr.: *See*—
Strada, Antonio; Bertschy, Alain; Guoli, Giacomo; and Mowka, Edmund J., Jr., 4,985,181, Cl. 261-87.000.
MTU Friedrichshafen GmbH: *See*—
Lemoine, Joseph, 4,985,315, Cl. 429-33.000.
Muegge, Joachim: *See*—
Schueler, Ralf; Muegge, Joachim; Droescher, Michael; Bartz, Wilfried; and Feinauer, Roland, 4,985,494, Cl. 525-67.000.
Mueller Co.: *See*—
Sands, Robert E.; and Floren, Carl E., 4,984,362, Cl. 29-890.128.
Muller, Franz J.: *See*—
Grimminger, Albert; Lauser, Wolfgang; Muller, Franz J.; Pfaff, Gerhard; and Schlipf, Edgar, 4,984,977, Cl. 425-145.000.
Muller, Fritz. Piston drive. 4,984,508, Cl. 92-13.500.
Muller, Ingrid: *See*—
Wingen, Rainer; Dubal, Hans-Rolf; Hemmerling, Wolfgang; Muller, Ingrid; and Ohlendorf, Dieter, 4,985,172, Cl. 252-299.670.
Multitech Systems (Proprietary) Limited: *See*—
Mazzullo, Raymond; and Van Zyl, Brian R., 4,985,806, Cl. 361-392.000.
Mummey, Dale B.; and Yohn, Brent D., to AMP Incorporated. Dual action operating mechanism for a plugboard system. 4,984,383, Cl. 439-259.000.
Muraji, Tetsuo, to Mikuni Kogyo Kabushiki Kaisha. Fuel injection system for injection carburetors. 4,984,547, Cl. 123-463.000.
Murakami, Mutsuaki: *See*—
Tsuchiya, Sohji; Murakami, Mutsuaki; and Yoshimura, Susumu, 4,985,330, Cl. 430-130.000.
Murakami, Shinkichi; Watanabe, Osamu; Wada, Sadahisa; and Inoue, Hiroshi, to Tonen Corporation. Thermosetting epoxy resin composition. 4,985,530, Cl. 528-103.000.
Murakami, Yoshiteru: *See*—
Ohta, Kenji; Takahashi, Akira; Katayama, Hiroyuki; Hirokane, Junji; and Murakami, Yoshiteru, 4,985,885, Cl. 369-275.100.
Murakami, Yuji: *See*—
Nakamura, Yoshiaki; Fujibayashi, Ryoichi; and Murakami, Yuji, 4,985,234, Cl. 424-45.000.
Muramoto, Naohiro; and Mine, Katsutoshi, to Toray Silicone Company, Ltd. Polysiloxane pattern-forming material with $SiO_{4/2}$ units and pattern formation method using same. 4,985,342, Cl. 430-280.000.
Murase, Shinzo: *See*—
Matsui, Hirokazu; and Murase, Shinzo, 4,985,809, Cl. 362-31.000.
Murata Kikai Kabushiki Kaisha: *See*—
Matsui, Isamu; and Tone, Shoichi, 4,984,749, Cl. 242-35.50R.
Murata Manufacturing Co., Ltd.: *See*—
Kohno, Yoshiaki; and Sakai, Norio, 4,985,098, Cl. 156-89.000.
Kouno, Yoshiaki; and Sakai, Morio, 4,985,103, Cl. 156-184.000.
Mori, Yoshiaki; Fujino, Masaru; Takagi, Hiroshi; and Sakabe, Yukio, 4,985,381, Cl. 501-136.000.
Nishikawa, Toshio; Tanaka, Hiroaki; and Shinmura, Satoru, 4,985,709, Cl. 343-787.000.
Watanabe, Shizuharu; Tani, Hiroji; and Kasanami, Tohru, 4,985,176, Cl. 252-521.000.
Murata, Yukichi: *See*—
Kawakami, Tetsuji; Imai, Akihiro; Taguchi, Nobuyoshi; Murata, Yukichi; and Hirota, Takao, 4,985,396, Cl. 503-227.000.
Murate, Massshi: *See*—
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Murayama, Akio: *See*—
Yamamoto, Tomiaki; Murayama, Akio; Kondo, Susumu; Hato, Hitoshi; Kamagami, Shinichi; and Matsumoto, Shoichi, 4,984,874, Cl. 350-334.000.
Murayama, Jin; and Kondo, Ryuji, to Fuji Photo Film Co., Ltd. Electronic still camera system. 4,985,775, Cl. 358-213.130.
Murch, Gerald M.: *See*—
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Murray, John E.: *See*—
Webb, David A., Jr.; Fite, David B.; Hetherington, Ricky C.; McKeen, Francis X.; Firstenberg, Mark A.; Murray, John E.; Manley, Dwight P.; Salett, Ronald M.; and Fossum, Tryggve, 4,985,825, Cl. 364-200.000.
Mussallem, Charles S., III, to No-Muv Corporation, Inc. Process for preparing carpet underlay. 4,985,279, Cl. 427-209.000.
Mussig, Bernhard; Meyer, Rolf-Volker; Dhein, Rolf; and Brassat, Bert, to Bayer Aktiengesellschaft. Process for the production of polyester-polyamide block polymers. 4,985,508, Cl. 525-420.500.
Muth, James C.; and Slattery, James J., to Spacesaver Corporation. Mobile shelving apparatus. 4,984,737, Cl. 238-281.000.
Muto, Shigeaki: *See*—
Sugita, Norifumi; Niimura, Koichi; Oguchi, Yoshiharu; Hirose, Kunitaka; Matsunaga, Kenichi; Oohara, Minoru; Muto, Shigeaki; Kakuchi, Junji; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 4,985,543, Cl. 530-396.000.
N.H.C., Inc.: *See*—
Hazard, Gary M., 4,984,560, Cl. 126-169.000.
Nabisco Brands, Inc.: *See*—
van Lengerich, Bernhard H., 4,984,514, Cl. 99-353.000.
Nadkarni, S. K.; and Raghavan, Narasimha S., to Lanxide Technology Company, LP. Improved ceramic composite structure comprising dross. 4,985,382, Cl. 501-155.000.
Nae-Won, Lee. Ashtray having cigarette snuffing device. 4,984,586, Cl. 131-256.000.
Nagai, Toshio, to Minami International Corp. Electrical appliance holder. 4,985,001, Cl. 439-527.000.
Nagamori, Hiroyuki: *See*—
Kuwamoto, Hiroshi; Sakaguchi, Yoshihiro; Nagamori, Hiroyuki; and Nakagawa, Yasuhiro, 4,985,158, Cl. 252-49.300.

Nagasaka, Hideki; and Takahashi, Noriaki, to Mitsubishi Kasei Corporation. Photopolymerizable compositions. 4,985,470, Cl. 522-26.000.
Nagasaki, Hideo; Yachigo, Shinichi; Takata, Takeshi; Yamamoto, Hiroki; and Takahashi, Yukoh, to Sumitomo Chemical Company, Ltd. Stabilized polyolefin composition. 4,985,479, Cl. 524-96.000.
Nagashima, Nobuyoshi; Matsumoto, Toshio; Yasuda, Shuhei; Kawaguchi, Takafumi; and Takeda, Makoto, to Sharp Kabushiki Kaisha. Field discriminating circuitry useful in LCD displays. 4,985,770, Cl. 358-152.000.
Nagashima, Shigeo: *See*—
Hamanaka, Naoki; Tanaka, Teruo; Omoda, Koichiro; Nagashima, Shigeo; Nakagoshi, Junji; and Ojima, Kazuo, 4,985,827, Cl. 364-200.000.
Nagashiro, Waichi: *See*—
Ishihara, Heigo; Osaki, Akira; Nagashiro, Waichi; and Maeda, Fuzio, 4,985,295, Cl. 428-213.000.
Nagata, Masaki: *See*—
Adachi, Ginya; Imanaka, Nobuhito; Aono, Hiromichi; Sugimoto, Eisuke; Sadaoka, Yoshihiko; Yasuda, Naoshi; Hara, Takeo; and Nagata, Masaki, 4,985,317, Cl. 429-191.000.
Nagata, Mitsuhiro: *See*—
Matsumura, Kazuo; Nagata, Mitsuhiro; and Tanaka, Tadashi, 4,985,097, Cl. 156-87.000.
Nagata, Yoshinori, to NEC Corporation. Modulation system capable of accurately compensating for nonlinearities of an amplifier connected thereto. 4,985,688, Cl. 332-123.000.
Nagatomo, Masao: *See*—
Ishii, Tatsuya; Okumura, Yoshinori; and Nagatomo, Masao, 4,985,368, Cl. 437-038.000.
Nagatsuka, Yoshihiro; and Fukuta, Kenji, to Agency of Industrial Science & Technology. Method and apparatus for sewing together pieces of cloth with jet streams. 4,984,340, Cl. 28-104.000.
Nagayama, Yasuji; and Ozaki, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device having selectable operational functions. 4,985,641, Cl. 307-272.300.
Nagel, Thomas O., to Trion Industries Inc. Apparatus for manufacturing a pre-assembled, two-part merchandise display hook. 4,984,356, Cl. 29-788.000.
Nagle, Dennis C.: *See*—
Moshier, William C.; Brupbacher, John M.; Christodoulou, Leontios; and Nagle, Dennis C., 4,985,202, Cl. 420-590.000.
Nahlovsky, Boris D.; and Zimmerman, Gilbert A., to United States of America, Air Force. Thermoplastic castable composite rocket propellant. 4,985,094, Cl. 149-19.920.
Naito, Kazuo: *See*—
Akiyama, Setsuo; Monobe, Hisanobu; Naito, Kazuo; Honda, Toshio; and Tanaka, Kazuo, 4,985,510, Cl. 525-427.000.
Nakabayashi, Satoru: *See*—
Tsuruoka, Tsutomu; Nakabayashi, Satoru; Fukuyasu, Harumi; Ishii, Yuuko; Tsuruoka, Takashi; Yamamoto, Haruo; Inouye, Shigeharu; and Kondo, Shinichi, 4,985,445, Cl. 514-315.000.
Nakabayashi, Toshiya, to Sony Corporation. Safety device for video cassette recorder. 4,985,666, Cl. 318-434.000.
Nakagawa, Masaharu: *See*—
Makino, Satoshi; Sasaki, Keiko; and Nakagawa, Masaharu, 4,985,244, Cl. 424-89.000.
Nakagawa, Masuo: *See*—
Satoh, Shuichi; Tsuji, Kazuwo; Nakashima, Takeru; Yazu, Shuji; Nisida, Yosio; Muro, Kiyofumi; Demizu, Yuzo; Nakagawa, Masuo; and Okada, Moritami, 4,985,226, Cl. 423-446.000.
Nakagawa, Yasuhiro: *See*—
Kuwamoto, Hiroshi; Sakaguchi, Yoshihiro; Nagamori, Hiroyuki; and Nakagawa, Yasuhiro, 4,985,158, Cl. 252-49.300.
Nakagoshi, Junji: *See*—
Hamanaka, Naoki; Tanaka, Teruo; Omoda, Koichiro; Nagashima, Shigeo; Nakagoshi, Junji; and Ojima, Kazuo, 4,985,827, Cl. 364-200.000.
Nakahara, Toshiaki: *See*—
Sakashita, Kiichiro; Tanikawa, Hirohide; Yoshida, Satoshi; Nakahara, Toshiaki; Matsushige, Naoki; Fujiwara, Masatsugu; and Mitsuhashi, Yasuo, 4,985,327, Cl. 430-106.600.
Nakai, Hiroto: *See*—
Kumagai, Shigeru; Iwahashi, Horoshi; and Nakai, Hiroto, 4,985,646, Cl. 307-448.000.
Nakai, Masaaki: *See*—
Egawa, Takeshi; Nakai, Masaaki; Nakanishi, Yasuo; Ishimura, Toshihiko; Nishimura, Shinichi; Tsuji, Sadafusa; and Ishibashi, Kenji, 4,985,723, Cl. 354-400.000.
Nakaizumi, Kazuo, to NEC Corporation. Compound semiconductor memory device having redundant circuit configuration. 4,985,866, Cl. 365-200.000.
Nakajima, Junjiro: *See*—
Irube, Makoto; Nakajima, Junjiro; Umehara, Hajime; Tada, Nobuo; and Ajima, Masayoshi, 4,985,199, Cl. 376-442.000.
Nakajima, Kenji: *See*—
Seo, Iwao; Nakajima, Kenji; and Kishimoto, Manabu, 4,985,179, Cl. 252-587.000.
Nakajima, Nobuyoshi: *See*—
Higaki, Nobuaki; Ishida, Masamitsu; and Nakajima, Nobuyoshi, 4,985,630, Cl. 250-327.200.
Nakajima, Toshiyuki: *See*—
Nose, Noriyuki; Nakajima, Toshiyuki; Kawakami, Eigo; Baba, Takeshi; Kushibiki, Nobuo; Matsugu, Masakazu; and Niwa, Yukichi, 4,985,186, Cl. 264-1.700.
Nakamoto, Masato: *See*—
Shimizu, Keisuke; Matsumura, Takumi; and Nakamoto, Masato, 4,985,456, Cl. 514-467.000.
Nakamura, Akihiro: *See*—
Nakazato, Horoshi; Iijima, Mamoru; and Nakamura, Akihiro, 4,984,953, Cl. 414-331.000.
Nakamura, Hiroyuki: *See*—
Iizuka, Shigeo; Nakamura, Hiroyuki; Kishi, Takao; and Endo, Syuzo, 4,984,918, Cl. 401-4.000.
Nakamura, Hisanori: *See*—
Yomogida, Toshihiko; Uchida, Akira; Kobayashi, Goro; and Nakamura, Hisanori, 4,985,886, Cl. 370-1.000.
Nakamura, Hisashi; and Fukumoto, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Thermal printer with a tension roller. 4,985,711, Cl. 346-76.0PH.
Nakamura, Masafumi: *See*—
Tsuruoka, Toshiaki; Nakamura, Masafumi; and Mori, Shintaro, 4,985,648, Cl. 307-456.000.
Nakamura, Masato: *See*—
Furuya, Koichi; Nakashima, Hiroshi; Iida, Yasunobu; Takeuchi, Nobuyuki; and Nakamura, Masato, 4,985,312, Cl. 428-627.000.
Nakamura, Nobutaka: *See*—
Take, Masafumi; Takeda, Haruo; and Nakamura, Nobutaka, 4,984,469, Cl. 73-770.000.
Nakamura, Shigekazu: *See*—
Matsushima, Jun; Kageyama, Tetsuto; Nakamura, Shigekazu; and Wakazono, Kenji, 4,984,474, Cl. 73-862.330.
Nakamura, Shigeru; Tsunoda, Yoshito; and Maeda, Takeshi, to Hitachi, Ltd. Optical card having optical grooves for access and wobbled marks for tracking and a recording-reproducing apparatus therefor. 4,985,616, Cl. 235-494.000.
Nakamura, Shinya: *See*—
Kikuchi, Shiego; and Nakamura, Shinya, 4,985,787, Cl. 360-78.020.
Nakamura, Tadashi: *See*—
Iida, Hajime; and Nakamura, Tadashi, 4,985,611, Cl. 219-87.000.
Nakamura, Toshihide: *See*—
Tsurumi, Kazunori; Nakamura, Toshihide; and Sato, Akira, 4,985,386, Cl. 502-185.000.
Nakamura, Tsutomu: *See*—
Watanabe, Tetsuya; Sato, Yoshio; Nakamura, Tsutomu; Kumagai, Naoki; and Kamono, Takashi, 4,984,996, Cl. 439-326.000.
Nakamura, Yoshiaki; Fujibayashi, Ryoichi; and Murakami, Yuji, to Sunstar Kabushiki Kaisha. Iodine microbicide composite. 4,985,234, Cl. 424-45.000.
Nakamura, Yoshinobu: *See*—
Yamada, Mikio; and Nakamura, Yoshinobu, 4,984,804, Cl. 273-235.00R.
Nakamura, Yukio: *See*—
Nakano, Masao; Mori, Keiichi; Hiraiwa, Yoshitaka; Iizuka, Shoji; Shima, Shozo; and Nakamura, Yukio, 4,984,904, Cl. 374-139.000.
Nakanishi, Yasuo: *See*—
Egawa, Takeshi; Nakai, Masaaki; Nakanishi, Yasuo; Ishimura, Toshihiko; Nishimura, Shinichi; Tsuji, Sadafusa; and Ishibashi, Kenji, 4,985,723, Cl. 354-400.000.
Nakano, Hiroshi: *See*—
Nishio, Takeyoshi; Yamauchi, Shinichi; Arashiro, Yusuke; Ohno, Kenyu; Yokoyama, Masuzo; Nakano, Hiroshi; Ohmori, Hiroshi; Mayumi, Junji; and Kihira, Michiharu, 4,985,495, Cl. 525-68.000.
Nakano, hiroyuki: *See*—
Shinoda, Akihisa; Fujita, Motohiro; Tsusaka, Haruo; Yonezawa, Makoto; and Nakano, hiroyuki, 4,984,539, Cl. 123-41.420.
Nakano, Masao; Mori, Keiichi; Hiraiwa, Yoshitaka; Iizuka, Shoji; Shima, Shozo; and Nakamura, Yukio, to Kawaso Electric Industrial Co., Ltd.; Kurosaki Refractories Co., Ltd.; and Nippon Steel Corporation. Apparatus for continuously measuring temperature of molten metal and method for making same. 4,984,904, Cl. 374-139.000.
Nakano, Tomio; and Nomura, Hidenori, to Fujitsu Limited; and Fujitsu VLSI Limited. Dynamic randdm access memory having improved refresh timing. 4,985,868, Cl. 365-222.000.
Nakano, Yasuaki: *See*—
Fujisawa, Hiromichi; Hatakeyama, Atsushi; Nakano, Yasuaki; Higashino, Junichi; and Hananoi, Toshihiro, 4,985,863, Cl. 364-900.000.
Nakao, Yasumasa: *See*—
Tanaka, Chikao; Ito, Setsuro; Nakao, Yasumasa; and Maeda, Kei, 4,985,375, Cl. 501-5.000.
Nakashima, Hiroshi: *See*—
Furuya, Koichi; Nakashima, Hiroshi; Iida, Yasunobu; Takeuchi, Nobuyuki; and Nakamura, Masato, 4,985,312, Cl. 428-627.000.
Nakashima, Norihiko; Kanoh, Yoshiji; Suzuki, Atsushi; and Ueda, Sadashi, to Kao Corporation. Thermosensitive recording medium. 4,985,390, Cl. 503-208.000.
Nakashima, Takeru: *See*—
Satoh, Shuichi; Tsuji, Kazuwo; Nakashima, Takeru; Yazu, Shuji; Nisida, Yosio; Muro, Kiyofumi; Demizu, Yuzo; Nakagawa, Masuo; and Okada, Moritami, 4,985,226, Cl. 423-446.000.
Nakasho, Hideaki: *See*—
Akiyama, Shunichi; Sato, Norio; Suzuki, Kenichirou; Yoshimoto, Taisuke; and Nakasho, Hideaki, 4,985,211, Cl. 422-171.000.
Nakata, Masahiro: *See*—
Hayakawa, Kunio; Furuya, Hiromi; Shimada, Hisanori; Nakata, Masahiro; Kodera, Kaoru; Oohara, Kouji; and Akagi, Nobuo, 4,985,345, Cl. 430-335.000.

Nakata, Yasuo: *See*—
Yoshida, Yoshio; Ogata, Nobuo; Ishii, Mitsuo; Kurata, Yukio; Nakata, Yasuo; Inoue, Takayuki; and Inoue, Kazuko, 4,985,880, Cl. 369-13.000.
Nakatani, Hiroshi, to Sharp Kabushiki Kaisha. Display device. 4,985,663, Cl. 315-169.300.
Nakatsuka, Takashi: *See*—
Ishiguro, Masaji; Iwata, Hiromitsu; Nakatsuka, Takashi; Nakayama, Kiyoharu; Miyahara, Osamu; and Noguchi, Kenichi, 4,985,575, Cl. 549-484.000.
Nakawaki, Yasunori: *See*—
Asada, Toshiyuki; Higashiyama, Yasuhiko; Nakawaki, Yasunori; Suzuki, Toshitake; Abe, Akiharu; and Moriguchi, Naoki, 4,985,011, Cl. 475-278.000.
Nakayama, Kiyoharu: *See*—
Ishiguro, Masaji; Iwata, Hiromitsu; Nakatsuka, Takashi; Nakayama, Kiyoharu; Miyahara, Osamu; and Noguchi, Kenichi, 4,985,575, Cl. 549-484.000.
Nakayama, Shigenobu; and Ikeda, Fumiaki, to Mitsui Toatsu Chemicals, Incorporated. Catechol diacetate derivatives for inducing the production of nerve growth factor to treat degenerative diseases in the central nervous system. 4,985,458, Cl. 514-533.000.
Nakayama, Tetsuro, to Tokyo Electric Company, Ltd. Ink dot printer. 4,984,911, Cl. 400-124.000.
Nakayama, Toshimasa: *See*—
Tokutake, Nobuo; Takahashi, Koichi; Satoh, Yoshiyuki; Kohara, Hidekatsu; and Nakayama, Toshimasa, 4,985,333, Cl. 430-192.000.
Nakazato, Horoshi; Iijima, Mamoru; and Nakamura, Akihiro, to Canon Kabushiki Kaisha. Plate-like article conveying system. 4,984,953, Cl. 414-331.000.
Nakazawa, Yoshinori: *See*—
Ohuchi, Kiyoyuki; Nakazawa, Yoshinori; and Matsuno, Kenichi, 4,984,445, Cl. 72-360.000.
Nakazumi, Akira; and Imamura, Nobuaki, to Kabushiki Kaisha Kobe Seiko Sho. Robot controller. 4,985,668, Cl. 318-568.200.
Nako, Osamu: *See*—
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,984,552, Cl. 123-492.000.
Namisato, Tooru, to Seiko Instruments Inc. Electronic watch with moving member. 4,985,877, Cl. 368-76.000.
Nanba, Seiji, to Mazda Motor Corporation. Cooling system for V-type engine. 4,984,538, Cl. 123-41.100.
Nanba, Toshiyuki: *See*—
Takatsuki, Toyohiko; Kirimoto, Atsushi; and Nanba, Toshiyuki, 4,984,611, Cl. 141-65.000.
Napoletano, Mauro: *See*—
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Napoletano, Mauro; and Sala, Alberto, 4,985,428, Cl. 514-252.000.
Narayan, Chandrasekhar: *See*—
Agarwala, Birendra N.; Beckman, Keith F.; Cooper-Joselow, Alice H.; Narayan, Chandrasekhar; Purushothaman, Sampath; and Ray, Sudipta K., 4,985,310, Cl. 428-620.000.
Narita, Tomonori, to Tokyo Electron Limited. Method of forming conductive layer including removal of native oxide. 4,985,372, Cl. 437-192.000.
Naruhn, Markus: *See*—
Melzer, Andreas; Naruhn, Markus; Kipfmuller, Karl; Reidenbach, H. D.; and Buess, Gerd, 4,985,030, Cl. 606-51.000.
Narula, Anubhav P. S.; and De Virgilio John J., to International Flavors & Fragrances Inc. 2-Methyl-1-nitrilo-2-methyl -1-hydroxylamino-3-(methoxyphenyl) propane, organoleptic uses thereof and processes for preparing same. 4,985,402, Cl. 512-6.000.
Narula, Anubhav P. S.; Beck, Charles E. J.; and Hanna, Marie R., to International Flavors & Fragrances Inc. Use of adamantane derivatives in augmenting or enhancing the aroma of consumable materials. 4,985,403, Cl. 512-19.000.
Narumi, Isao: *See*—
Utunomiya, Jiro; Iida, Saburo; Sibuya, Hitosi; Kusaba, Kazunori; and Narumi, Isao, 4,985,747, Cl. 357-68.000.
Naruse, Yoshihiro; Kato, Hideharu; and Iwata, Yoshifumi, to Aisin Seiki Kabushiki Kaisha. Secure communication control system. 4,985,919, Cl. 380-18.000.
National Energy Council: *See*—
Cronje, Izak J.; Dekker, Johannes; and Cloete, Thomas E., 4,985,150, Cl. 210-661.000.
National Research Development Corporation: *See*—
Baker, James A.; James, Stuart L.; Ibrahim, Tuncel; and Marriott, Christopher, 4,985,462, Cl. 514-623.000.
Hughes, Leslie R.; Oldfield, John; and Pegg, Stephen J., 4,985,441, Cl. 514-260.000.
National Semiconductor: *See*—
Aronowitz, Sheldon; Forsythe, Donald D.; Walker, George P.; and Gadepally, Bhaskar V. S., 4,985,717, Cl. 357-23.500.
National Semiconductor Corporation: *See*—
Proebsting, Robert J., 4,985,643, Cl. 307-443.000.
Natsume, Masahito: *See*—
Matsuoka, Hidetoshi; and Natsume, Masahito, 4,985,785, Cl. 360-62.000.
Natsume, Yoshinori: *See*—
Kitahara, Koichi; Natsume, Yoshinori; and Hosoki, Yoshinori, 4,985,745, Cl. 357-49.000.
Naumann, Rolf; Rademachers, Jakob; and Rodi, Fritz, to Bayer Aktiengesellschaft. Needle shaped alloy powders based on iron and their use. 4,985,073, Cl. 75-255.000.
Naya, Koutarou; Shiinoki, Kazuaki; Hayakawa, Tadashi; Masujima, Kiyoshi; Uchida, Riichi; and Matsubara, Katsumi, to Hitachi, Ltd. Screw type vacuum pump with introduced inert gas. 4,984,974, Cl. 418-87.000.
Naylor, Alan: *See*—
Waterhouse, Ian; Naylor, Alan; Wallis, Christopher J.; and Ellis, Frank, 4,985,427, Cl. 514-242.000.
NEC Corporation: *See*—
Fujiwara, Ryuhei; Fukazawa, Yasuo; and Asano, Takashi, 4,985,891, Cl. 370-110.100.
Fukunaga, Masayuki, 4,985,914, Cl. 379-88.000.
Ishijima, Toshiyuki, 4,985,718, Cl. 357-23.600.
Kaneyama, Hideyo, 4,985,703, Cl. 341-141.000.
Kawabe, Shigehisa; and Hirayama, Keiichi, 4,985,756, Cl. 358-22.000.
Kawada, Shigeru, 4,985,647, Cl. 307-449.000.
Koga, Toshio; Ohki, Junichi; Ohta, Mutsumi; and Kunihiro, Hideto, 4,985,782, Cl. 358-335.000.
Nagata, Yoshinori, 4,985,688, Cl. 332-123.000.
Nakaizumi, Kazuo, 4,985,866, Cl. 365-200.000.
Taniji, Yukio, 4,985,776, Cl. 358-213.230.
Tsutsui, Hiroaki, 4,985,645, Cl. 307-446.000.
Yamashina, Masakazu; Yamada, Hachiro; and Enomoto, Tadayoshi, 4,985,861, Cl. 364-746.200.
NEC Home Electronics Ltd.: *See*—
Koga, Toshio; Ohki, Junichi; Ohta, Mutsumi; and Kunihiro, Hideto, 4,985,782, Cl. 358-335.000.
Nedorezov, Vladimir A.: *See*—
Azamatov, Ramil A.; Zamitter, Mikhail N.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; and Smirnov, Igor G., 4,984,817, Cl. 280-680.000.
Neilson, Diane H. R.; Work, Sara L. R.; Whaley, Edward L.; Kirkpatrick, Steven J.; and McCarthy, James P., to Procter & Gamble Company, The. Process for treating coffee beans to make a better-tasting coffee. 4,985,271, Cl. 426-595.000.
Neiman: *See*—
Jawdoszyn, Claude, 4,984,481, Cl. 74-577.00S.
Nelson, Bradley H., to Microelectronics and Computer Technology Corporation. Method of assembling stacks of integrated circuit dies. 4,984,358, Cl. 29-830.000.
Nelson, Thomas E., to Soltech, Inc. Insulation structure for appliances. 4,985,106, Cl. 156-276.000.
Neri, Carlo; Nodari, Nereo; and Sandre, Giovanni, to Enichem Synthesis, S.p.A. Solid stabilizer composition for synthetic polymers. 4,985,481, Cl. 524-120.000.
Nesbit, Charles E.; and Nesbit, Mark S. Illuminated basketball basket rim and illuminated basketball backboard. 4,984,787, Cl. 273-1.50R.
Nesbit, Mark S.: *See*—
Nesbit, Charles E.; and Nesbit, Mark S., 4,984,787, Cl. 273-1.50R.
Nestec S.A.: *See*—
Klug, David M.; and Merz, Vernon R., 4,985,263, Cl. 426-302.000.
Nestvall, Per; and Rodskier, Christian, to AB Volvo Penta. Boat-propeller unit. 4,985,005, Cl. 440-2000.000.
Neuman, Victor: *See*—
Parriaux, Olivier; Neuman, Victor; and Voirin, Guy, 4,984,863, Cl. 350-96.110.
Neumann, Eugene F.; August, Melvin C.; and Bowen, Stephen A., to Cray Research, Inc. Two-piece edge ZIF connector with sliding block. 4,984,993, Cl. 439-157.000.
Neumann, Peter: *See*—
Spang, Peter; Neumann, Peter; and Trauth, Hubert, 4,985,566, Cl. 548-328.000.
Neville, Richard E. G., to GBE International PLC. Rotary cylinder dryer and method of drying tobacco products. 4,984,587, Cl. 131-305.000.
New Tech Co., Ltd.: *See*—
Moon, Byungmoon, 4,985,721, Cl. 354-308.000.
Newa S.r.l.: *See*—
Strada, Antonio; Bertschy, Alain; Guoli, Giacomo; and Mowka, Edmund J., Jr., 4,985,181, Cl. 261-87.000.
Newington Corporation: *See*—
Farnsworth, Dennis G., 4,984,503, Cl. 81-13.000.
Newman, Richard S.: *See*—
Silverman, Stanley; Konechy, Kenneth A.; Van De Walker, Ray G.; and Newman, Richard S., 4,984,913, Cl. 400-249.000.
NGK Insulators, Ltd.: *See*—
Abe, Hiroaki; and Toyoda, Shuhei, 4,984,875, Cl. 350-377.000.
Seike, Shoji; Mima, Toshiyuki; and Mori, Koichi, 4,984,860, Cl. 350-96.100.
NGK Spark Plug Co., Ltd.: *See*—
Amano, Kozo; and Matsubara, Yoshihiro, 4,984,905, Cl. 374-143.000.
Kojima, Takio; and Ito, Masaya, 4,984,927, Cl. 403-30.000.
Nguyen, Dat: *See*—
Sansevero, Frank; and Nguyen, Dat, 4,984,671, Cl. 198-328.000.
Niaura, Vitas; Oxley, Jeffery A.; and Tarika, Elio E. Food body with surface color indicia. 4,985,260, Cl. 426-87.000.
Nichols, Kirby B.: *See*—
Aull, Brian F.; Nichols, Kirby B.; and Sollner, T. C. L. Gerhard, 4,985,621, Cl. 250-213.00A.
Nickels, James G. Portable security lock. 4,984,834, Cl. 292-297.000.

Nicoh Company, Ltd.: *See*—
Inada, Toshio; Ueda, Aki; Mifune, Hironobu; and Ogura, Yukio, 4,985,618, Cl. 250-208.100.
Niederreiter, Hans, to Siemens Aktiengesellschaft. DC voltage converter with formation of the actual current value. 4,985,818, Cl. 363-19.000.
Nightingale, Douglas J., to Rolls-Royce Inc. Vectorable variable flow area propulsion nozzle. 4,984,741, Cl. 239-265.170.
Nihon Bunko Kogyo Kabushiki Kaisha: *See*—
Saito, Muneo; Yamauchi, Yoshio; Kashiwazaki, Hiromi; Sugawara, Michiaki; and Hondo, Toshinobu, 4,984,602, Cl. 137-487.500.
Nihon Cement Co., Ltd.: *See*—
Yamabe, Keiji; and Yoshinaga, Masao, 4,984,675, Cl. 198-365.000.
Nihon Kohden Corporation: *See*—
Ono, Kohei; Satoh, Hitoshi; and Kutsuma, Masako, 4,985,852, Cl. 364-519.000.
Nihon Parkerizing Co., Ltd.: *See*—
Mori, Kazuhiko; Ishii, Hitoshi; and Miyawaki, Toshi, 4,985,087, Cl. 148-273.000.
Nii, Satoshi. Method of manufacture of fermented soybean food without cooking. 4,985,259, Cl. 426-46.000.
Niimura, Koichi: *See*—
Sugita, Norifumi; Niimura, Koichi; Oguchi, Yoshiharu; Hirose, Kunitaka; Matsunaga, Kenichi; Oohara, Minoru; Muto, Shigeaki; Kakuchi, Junji; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 4,985,543, Cl. 530-396.000.
Nikaido, Masaru; Homma, Katsuhisa; and Kinoshita, Tadayoshi, to Kabushiki Kaisha Toshiba. Thermal head. 4,985,712, Cl. 346-76.0PH.
Nikken Chemicals Co., Ltd.: *See*—
Suzuki, Kenichi; Inada, Haruaki; Kiue, Akira; and Sano, Tetsuro, 4,985,558, Cl. 546-256.000.
Nilssen, Ole K. Electronic ballast with high power factor. 4,985,664, Cl. 315-209.00R.
Ninomiya, Kunihiro: *See*—
Morita, Shuji; Saito, Ken-Ichi; Ninomiya, Kunihiro; Tobe, Akihiro; Nitta, Issei; and Sugano, Mamoru, 4,985,430, Cl. 514-253.000.
Niosi, Donald E.: *See*—
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,984,417, Cl. 56-11.300.
Nippei Toyama Corporation: *See*—
Kobayashi, Shigeo, 4,984,390, Cl. 51-5.00D.
Nippon Kokan Kabushiki Kaisha: *See*—
Kuwamoto, Hiroshi; Sakaguchi, Yoshihiro; Nagamori, Hiroyuki; and Nakagawa, Yasuhiro, 4,985,158, Cl. 252-49.300.
Ohno, Yotaro; Matsuura, Masahiro; Sato, Kenkichi; and Fukuyo, Hiroshi, 4,985,075, Cl. 75-460.000.
Saigo, Takeshi; Tokuya, Tomohiko; Kamimura, Haruo; Hori, Mitsuaki; and Yasuoka, Hidenori, 4,984,829, Cl. 285-334.000.
Nippon Oil Company, Ltd.: *See*—
Saito, Naohide; Shibuya, Shohei; and Inomata, Kentaro, 4,985,140, Cl. 208-347.000.
Nippon Oil and Fats Company, Limited: *See*—
Ochi, Koji; Harada, Masahide; and Kobayashi, Kunio, 4,984,519, Cl. 102-217.000.
Yamamoto, Shosaku; and Kakinuma, Kazuo, 4,985,500, Cl. 525-123.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Kimura, Kazumasa; Hatsuda, Takumi; Irie, Yoshio; and Shimomura, Tadao, 4,985,514, Cl. 526-88.000.
Nippon Soda Co., Ltd.: *See*—
Ishiguro, Masaji; Iwata, Hiromitsu; Nakatsuka, Takashi; Nakayama, Kiyoharu; Miyahara, Osamu; and Noguchi, Kenichi, 4,985,575, Cl. 549-484.000.
Nippon Soken, Inc.: *See*—
Idogaki, Takaharu; Hayashi, Ikuo; Ishihara, Toshihisa; Inoue, Hideo; and Sugitani, Tatsuo, 4,984,463, Cl. 73-516.00R.
Nippon Steel Chemical Co., Ltd.: *See*—
Sugawara, Hitoshi; Goto, Minoru; Sakamaki, Yoshitaka; and Fujita, Toshio, 4,985,208, Cl. 422-135.000.
Nippon Steel Corporation: *See*—
Nakano, Masao; Mori, Keiichi; Hiraiwa, Yoshitaka; Iizuka, Shoji; Shima, Shozo; and Nakamura, Yukio, 4,984,904, Cl. 374-139.000.
Shindou, Yoshio; and Yamazaki, Fumio, 4,985,311, Cl. 428-623.000.
Nippon Television Network Corporation: *See*—
Sugimori, Yoshio; Kimata, Yoshihide; Kurosaki, Tadao; and Urano, Joji, 4,985,771, Cl. 358-160.000.
Nippon Wiperblade Co., Ltd.: *See*—
Arai, Masaru; and Saita, Itsuro, 4,984,325, Cl. 15-250.200.
Nippon Zoki Pharmaceutical Co., Ltd.: *See*—
Ishii, Akira; Yamakawa, Masahiro; and Toyomaki, Yoshio, 4,985,453, Cl. 514-386.000.
Konishi, Jin-emon, 4,985,254, Cl. 424-520.000.
Toyomaki, Yoshio; Nishikawa, Katsumi; and Kawakubo, Hitoshi, 4,985,354, Cl. 435-13.000.
Yamada, Toshio; and Kageyama, Ken-ichi, 4,985,409, Cl. 514-46.000.
Nippondenso Co., Ltd.: *See*—
Tokura, Norihito; Ito, Hiroyasu; and Okabe, Naoto, 4,985,743, Cl. 357-39.000.
Nishi, Yutaka: *See*—
Sano, Shoichi; Furukawa, Yoshimi; Takei, Akihiko; Nishi, Yutaka; and Ohno, Yasuaki, 4,984,646, Cl. 180-79.100.
Nishiguchi, Masayuki: *See*—
Kimura, Naomasa; Nishiguchi, Masayuki; and Noguchi, Minoru, 4,985,108, Cl. 156-272.400.
Nishikawa, Katsumi: *See*—
Toyomaki, Yoshio; Nishikawa, Katsumi; and Kawakubo, Hitoshi, 4,985,354, Cl. 435-13.000.
Nishikawa, Kohei: *See*—
Terao, Shinji; and Nishikawa, Kohei, 4,985,447, Cl. 514-333.000.
Nishikawa, Makoto; Takamatsu, Hideo; Ishii, Masao; and Minatono, Shobu, to Kuraray Company Ltd. Pressure sensitive adhesive composition. 4,985,499, Cl. 525-89.000.
Nishikawa, Seiichi: *See*—
Kojima, Masahiro; Nishikawa, Seiichi; and Takahashi, Nobuaki, 4,984,485, Cl. 74-866.000.
Nishikawa, Susumu: *See*—
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,836, Cl. 364-426.020.
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,838, Cl. 364-426.020.
Nishikawa, Toshio; Tanaka, Hiroaki; and Shinmura, Satoru, to Murata Manufacturing Co., Ltd. Magnetostatic wave device. 4,985,709, Cl. 343-787.000.
Nishimoto, Masato, to Yamaichi Electric Mfg. Co., Ltd. IC socket. 4,984,991, Cl. 439-72.000.
Nishimura, Eiji: *See*—
Masuda, Yoshihiro; Yagi, Takashi; and Nishimura, Eiji, 4,985,720, Cl. 354-299.000.
Nishimura, Kazuhiko, to Tokai Rubber Industries, Ltd. Rubber hose. 4,984,604, Cl. 138-126.000.
Nishimura, Michio: *See*—
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,984,417, Cl. 56-11.300.
Nishimura, Shigehiro, to Victor Company of Japan, Ltd. Tape cassette. 4,984,753, Cl. 242-199.000.
Nishimura, Shinichi: *See*—
Egawa, Takeshi; Nakai, Masaaki; Nakanishi, Yasuo; Ishimura, Toshihiko; Nishimura, Shinichi; Tsuji, Sadafusa; and Ishibashi, Kenji, 4,985,723, Cl. 354-400.000.
Nishimura, Takao: *See*—
Kuroda, Toru; and Nishimura, Takao, 4,985,153, Cl. 210-782.000.
Nishimura, Yukinobu: *See*—
Shimomura, Setsuhiro; Wataya, Seiji; Nishimura, Yukinobu; and Okubo, Satoru, 4,984,546, Cl. 123-425.000.
Nishino, Atsushi; Kimura, Kunio; Takeuchi, Yasuhiro; and Ishihara, Koji, to Matsushita Electric Industrial Co., Ltd. Burner skeleton. 4,985,291, Cl. 428-116.000.
Nishio, Takeyoshi; Yamauchi, Shinichi; Arashiro, Yusuke; Ohno, Kenyu; Yokoyama, Masuzo; Nakano, Hiroshi; Ohmori, Hiroshi; Mayumi, Junji; and Kihira, Michiharu, to Toyota Jidosha Kabushiki Kaisha; and Mitsubishi Petrochemical Co., Ltd. Resin composition. 4,985,495, Cl. 525-68.000.
Nishiwaki, Ituo: *See*—
Iwanaga, Shin-ichiro; Matsunaga, Tatsuaki; Nishiwaki, Ituo; and Enyo, Hiroji, 4,985,513, Cl. 526-80.000.
Nishiyama, Ryoji: *See*—
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,984,552, Cl. 123-492.000.
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Fuel injection device for an internal combustion engine. 4,984,552, Cl. 123-492.000.
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, to Zaidan Hojin Handotai Kenkyu Shinkokai. Semiconductor switching device. 4,985,738, Cl. 357-22.000.
Nisida, Yosio: *See*—
Satoh, Shuichi; Tsuji, Kazuwo; Nakashima, Takeru; Yazu, Shuji; Nisida, Yosio; Muro, Kiyofumi; Demizu, Yuzo; Nakagawa, Masuo; and Okada, Moritami, 4,985,226, Cl. 423-446.000.
Nissan Chemical Industries, Ltd.: *See*—
Obitsu, Masamichi; Tomi, Isao; and Kaga, Takao, 4,985,229, Cl. 423-608.000.
Nissan Motor Company, Limited: *See*—
Hayashi, Toshihiko, 4,984,350, Cl. 29-525.100.
Seko, Yasutoshi; and Saito, Tomoko, 4,985,816, Cl. 362-303.000.
Shimizu, Kenzo; and Ogata, Shizuo, 4,984,822, Cl. 280-804.000.
Sugano, Kazuhiko, 4,984,664, Cl. 192-3.300.
Nissin Chemical Industry Co., Ltd.: *See*—
Yamada, Koichiro; Tanaka, Masaki; Ohba, Toshio; and Ohashi, Hiroshi, 4,985,155, Cl. 252-8.600.
Nissin Steel Company Ltd.: *See*—
Moriizumi, Shuichi; Masuhara, Kenichi; Yamabe, Hidetoshi; Tomosue, Takao; Mori, Kouji; and Kaneko, Hisaharu, 4,985,104, Cl. 156-244.110.
Nitta, Issei: *See*—
Morita, Shuji; Saito, Ken-Ichi; Ninomiya, Kunihiro; Tobe, Akihiro; Nitta, Issei; and Sugano, Mamoru, 4,985,430, Cl. 514-253.000.
Niu, Hiromi: *See*—
Sahashi, Masashi; Niu, Hiromi; and Inomata, Koichiro, 4,985,072, Cl. 75-246.000.
Niwa, Yukichi: *See*—
Nose, Noriyuki; Nakajima, Toshiyuki; Kawakami, Eigo; Baba, Takeshi; Kushibiki, Nobuo; Matsugu, Masakazu; and Niwa, Yukichi, 4,985,186, Cl. 264-1.700.

No-Muv Corporation, Inc.: *See*—
Mussallem, Charles S., III, 4,985,279, Cl. 427-209.000.
Noack, Ulrich: *See*—
Dahrendorf, Klaus D.; and Noack, Ulrich, 4,984,476, Cl. 73-864.350.
Nodari, Nereo: *See*—
Neri, Carlo; Nodari, Nereo; and Sandre, Giovanni, 4,985,481, Cl. 524-120.000.
Noguchi, Kenichi: *See*—
Ishiguro, Masaji; Iwata, Hiromitsu; Nakatsuka, Takashi; Nakayama, Kiyoharu; Miyahara, Osamu; and Noguchi, Kenichi, 4,985,575, Cl. 549-484.000.
Noguchi, Michio; Mori, Kazushige; Higashino, Nobuo; and Sunada, Motoki, to Kubota, Ltd. Work-implement adapter for front loader. 4,984,957, Cl. 414-723.000.
Noguchi, Minoru: *See*—
Kimura, Naomasa; Nishiguchi, Masayuki; and Noguchi, Minoru, 4,985,108, Cl. 156-272.400.
Noguchi, Toshiharu: *See*—
Eguchi, Kazuhiro; Ochiai, Eiichi; Ito, Shinichiro; Yoneda, Takehiko; Taki, Hiromitsu; Noguchi, Toshiharu; Kiyosue, Kuniaki; Yoshida, Akiro; Sagawa, Morikazu; and Makimoto, Mitsuo, 4,985,690, Cl. 333-222.000.
Noguchi, Yasutaka: *See*—
Kimizuka, Junichi; Inuyama, Toshihiko; Soya, Takashi; and Noguchi, Yasutaka, 4,985,896, Cl. 372-38.000.
Nohl, Klaus: *See*—
Fritsche, Rainer; Nohl, Klaus; Pollmann, Klaus; and Schmidt, Elmar, 4,985,205, Cl. 422-56.000.
Nomura, Hidenori: *See*—
Nakano, Tomio; and Nomura, Hidenori, 4,985,868, Cl. 365-222.000.
Nomura, Masami, to Mitsubishi Denki Kabushiki Kaisha. Elevator control apparatus. 4,984,659, Cl. 187-108.000.
Nomura, Masumi: *See*—
Ishikawa, Takamichi; Nomura, Masumi; and Takeuchi, Masuho, 4,985,190, Cl. 264-122.000.
Nonogaki, Saburo: *See*—
Uchino, Shoichi; Ueno, Takumi; Iwayanagi, Takao; Nonogaki, Saburo; and Hashimoto, Michiaki, 4,985,344, Cl. 430-325.000.
Nonoyama, Meihan: *See*—
Sakagami, Hiroshi; Konno, Kunio; and Nonoyama, Meihan, 4,985,249, Cl. 424-195.100.
Nonoyama, Noboru: *See*—
Ohshima, Yoshio; Watanabe, Tsunekazu; Watanabe, Keizaburo; Nonoyama, Noboru; Kitazume, Masayoshi; and Tomita, Yukihiro, 4,985,149, Cl. 210-603.000.
Norddeutsche Seekabelwerke Aktiengesellschaft: *See*—
Basse, Hartwig; and Wittek, Jurgen, 4,985,182, Cl. 261-94.000.
Norgard, Flemming: *See*—
Pedersen, Gunnar; and Norgard, Flemming, 4,984,562, Cl. 126-500.000.
Norita, Toshio: *See*—
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 4,985,774, Cl. 358-213.190.
Norris, Philip R., to Polaroid Corporation. Film dispenser with articulated catcher. 4,985,714, Cl. 346-107.00R.
Norsworthy, John A. Game box. 4,984,797, Cl. 273-145.00C.
Norsworthy, John P.: *See*—
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,985,848, Cl. 364-518.000.
North, Peter C.; Oxford, Alexander W.; Coates, Ian H.; and Beswick, Paul J., to Glaxo Group Limited. Lactam derivatives. 4,985,422, Cl. 514-215.000.
Northern Telecom Limited: *See*—
Pan, Ali, 4,984,357, Cl. 29-828.000.
Turudic, Andy, 4,985,675, Cl. 324-158.00R.
Norwood, David A.; Manns, Willims G.; and Wood, Anthony B., to Texas Instruments Incorporated. Method of detecting and reviewing pattern defects. 4,985,927, Cl. 382-8.000.
Nosaka, Masaaki: *See*—
Ito, Toshimichi; Nosaka, Masaaki; and Hosoya, Ikuo, 4,984,534, Cl. 118-723.000.
Ito, Toshimichi; Nosaka, Masaaki; and Hosoya, Ikuo, 4,985,227, Cl. 423-446.000.
Nose, Noriyuki; Nakajima, Toshiyuki; Kawakami, Eigo; Baba, Takeshi; Kushibiki, Nobuo; Matsugu, Masakazu; and Niwa, Yukichi, to Canon Kabushiki Kaisha. Process for producing optical element. 4,985,186, Cl. 264-1.700.
Noujaim, Sharbel E.: *See*—
Cline, Harvey E.; Hartley, Richard I.; Ludke, Siegwalt; and Noujaim, Sharbel E., 4,985,834, Cl. 364-413.220.
Novak, Ronald W.: *See*—
Redlich, George H.; and Novak, Ronald W., 4,985,064, Cl. 71-90.000.
Nowak, Ronald P.: *See*—
Aldrich, Gary R.; Brown, George T.; Millis, David B.; and Nowak, Ronald P., 4,985,855, Cl. 364-522.000.
Nozaki, Satoshi: *See*—
Kusumi, Hiroshi; Nozaki, Satoshi; and Yosida, Muneo, 4,984,936, Cl. 405-232.000.
Nozawa, Yasuto: *See*—
Iwasaki, Katsunori; Nozawa, Yasuto; and Tanigawa, Shigeho, 4,985,086, Cl. 148-101.000.
Nugues, Pierre: *See*—
Tikes, Jacques; Le Fur, Joel; and Nugues, Pierre, 4,985,659, Cl. 315-3.500.
Nunn, Randolph G., Jr.: *See*—
Tanner, Paul R.; Nunn, Randolph G., Jr.; and Luebbe, John P., 4,985,238, Cl. 424-66.000.
Nunotani, Sadao: *See*—
Karakama, Tadao; Ishizaki, Naoki; Takano, Toshiro; and Nunotani, Sadao, 4,984,603, Cl. 137-489.000.
Nurk, Siegfried, to SIPRA Patententwicklungs-und Beteiligungsgesellschfat mbH. Thread exchange device, particularly for knitting machines. 4,984,436, Cl. 66-144.000.
Nutrasweet Company, The: *See*—
Singer, Norman; Wilcox, Reed; Podolski, Joseph S.; Chang, Hsien-Hsin; Pookote, Suseelan; Dunn, John M.; and Hatchwell, Leora, 4,985,270, Cl. 426-515.000.
N.V. Michel Van de Wiele: *See*—
Maassen, Heinz; and Meyer, Gunter, 4,984,609, Cl. 139-449.000.
Nycomed /AS: *See*—
Klaveness, Jo; Jacobsen, Trond; and Lindberg, Bernt J., 4,985,233, Cl. 424-9.000.
Obara, Tadashi, to Kabushiki Kaisha Toshiba. Optical character reading apparatus with sorter. 4,984,692, Cl. 209-583.000.
Obata, Mitsuyoshi: *See*—
Takagi, Noboru; and Obata, Mitsuyoshi, 4,985,653, Cl. 310-88.000.
Obata, Tokio: *See*—
Yoshioka, Hirosuke; Obata, Tokio; Fujii, Katsutoshi; Tsutsumiuchi, Kiyoshi; and Yoshiya, Haruo, 4,985,426, Cl. 514-241.000.
Oberbach, Manfred: *See*—
Bruckner, Raimund; Eschner, Axel; Langenfeld, Wilhelm; Oberbach, Manfred; Rothfuss, Hans; and Stusser, Dieter, 4,984,769, Cl. 266-44.000.
Oberbaumer, Ilse, to Oberbaumer, Ilse. Vectors and methods for the construction of cDNA libraries. 4,985,359, Cl. 435-172.300.
Obermann, Peter; and Franetzki, Manfred, to Siemens Aktiengesellschaft. Dosing device for controlled injection of liquid from a reservoir into an organism. 4,985,015, Cl. 604-67.000.
Obitsu, Masamichi; Tomi, Isao; and Kaga, Takao, to Nissan Chemical Industries, Ltd. Process for manufacturing fine zirconium oxide powder. 4,985,229, Cl. 423-608.000.
Oblovatsky, Anatoly K.: *See*—
Azamatov, Ramil A.; Zamitter, Mikhail N.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; and Smirnov, Igor G., 4,984,817, Cl. 280-680.000.
O'Brien, James M.: *See*—
Penneck, Richard J.; O'Brien, James M.; Duckworth, Stephen J.; and Smith, Nicholas J. G., 4,985,313, Cl. 428-627.000.
Occupant Safety Systems Inc.: *See*—
Marrs, Samuel M.; Herodes, Victor; and Ransom, David, 4,984,752, Cl. 242-107.40A.
Ochi, Koji; Harada, Masahide; and Kobayashi, Kunio, to Nippon Oil and Fats Company, Limited; Harada Electronics Industry; and Hitachi Ltd. Delay circuit for use in electric blasting system. 4,984,519, Cl. 102-217.000.
Ochiai, Eiichi: *See*—
Eguchi, Kazuhiro; Ochiai, Eiichi; Ito, Shinichiro; Yoneda, Takehiko; Taki, Hiromitsu; Noguchi, Toshiharu; Kiyosue, Kuniaki; Yoshida, Akiro; Sagawa, Morikazu; and Makimoto, Mitsuo, 4,985,690, Cl. 333-222.000.
Odenwalder, Heinrich: *See*—
Matejec, Reinhart; Odenwalder, Heinrich; Ohlschlager, Hans; and Wolff, Erich, 4,985,351, Cl. 430-598.000.
Odnoral, Alexandr P.; Tolmachev, Nikolai S.; and Tjutkin, Vladimir A. Electric drive with manual doubler. 4,985,735, Cl. 335-299.000.
O'Donnell, Patrick F. Article for mounting objects. 4,984,763, Cl. 248-218.100.
Oelkrug, Dieter: *See*—
Kessler, Rudolf; Degen, Winfried; Oelkrug, Dieter; and Tubach, Martin, 4,985,622, Cl. 250-226.000.
Oesterreichische Investitionskredit Aktiengesellschaft and Ionen Mikrofabrications: *See*—
Stengl, Gerhard; and Glavish, Hilton F., 4,985,634, Cl. 250-492.200.
Oestreich, Ulrich: *See*—
Mayr, Ernst; and Oestreich, Ulrich, 4,985,185, Cl. 264-1.500.
Ogasawara, Kunio: *See*—
Takano, Seiichi; Shimazaki, Yohichi; Sekiguchi, Yoshinori; and Ogasawara, Kunio, 4,985,571, Cl. 549-283.000.
Ogata, Kentarou; Kodama, Satoshi; and Murate, Masashi, to Toyota Jidosha Kabushiki Kaisha. Method and device for painting side outer panels of an automobile body. 4,985,283, Cl. 427-424.000.
Ogata, Nobuo: *See*—
Yoshida, Yoshio; Ogata, Nobuo; Ishii, Mitsuo; Kurata, Yukio; Nakata, Yasuo; Inoue, Takayuki; and Inoue, Kazuko, 4,985,880, Cl. 369-13.000.
Ogata, Shizuo: *See*—
Shimizu, Kenzo; and Ogata, Shizuo, 4,984,822, Cl. 280-804.000.
Ogawa, Fumihiko; Hori, Kazunobu; Asai, Keiichi; and Watanabe, Tomoyoshi, to Suzuki Motor Company Limited. Car providing a sliding door. 4,984,842, Cl. 296-155.000.
Ogawa, Shinji: *See*—
Ooe, Takashi; Ogawa, Shinji; Miura, Akiko; and Itatani, Ryohei, 4,985,213, Cl. 422-186.010.
Ogawara, Akihiro, to Fujitsu Limited. High speed switching system in a radio-communication system including a plurality of main communication systems and a plurality of stand-by communication systems. 4,985,904, Cl. 375-38.000.

Ogawara, Hisashi: *See*—
Mochizuki, Akira; Sato, Yoshio; Ogawara, Hisashi; and Yamashita, Syuzo, 4,985,147, Cl. 210-500.270.
Ogitani, Osamu; and Fujii, Ryuichi, to Somar Corporation. Hardenable resin composition. 4,985,474, Cl. 522-107.000.
Ogoda, Makoto: *See*—
Saito, Yuuji; and Ogoda, Makoto, 4,984,780, Cl. 271-292.000.
Oguchi, Yoshiharu: *See*—
Sugita, Norifumi; Niimura, Koichi; Oguchi, Yoshiharu; Hirose, Kunitaka; Matsunaga, Kenichi; Oohara, Minoru; Muto, Shigeaki; Kakuchi, Junji; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 4,985,543, Cl. 530-396.000.
Ogura, Kuniaki; Oota, Junichi; Abe, Teruyoshi; and Takajo, Shigeaki, to Kawasaki Steel Corporation. Alloyed steel powder for powder metallurgy. 4,985,309, Cl. 428-570.000.
Ogura, Yukio: *See*—
Inada, Toshio; Ueda, Aki; Mifune, Hironobu; and Ogura, Yukio, 4,985,618, Cl. 250-208.100.
Kageyama, Naoki; Kuchiwaki, Hiroji; Ito, Junki; Sakuma, Nobumitsu; and Ogura, Yukio, 4,984,567, Cl. 128-660.020.
Ogushi, Hiroshi, to Canon Kabushiki Kaisha. Manuscript reader. 4,985,617, Cl. 250-208.100.
Ohara, Kazuhiro: *See*—
Otsubo, Toru; Tokuda, Mitsuo; Yamaguchi, Yasuhiro; Sasaki, Ichirou; Ohara, Kazuhiro; Usuami, Hirohisa; and Azuma, Junzou, 4,985,109, Cl. 156-345.000.
Ohashi, Hiroshi: *See*—
Yamada, Koichiro; Tanaka, Masaki; Ohba, Toshio; and Ohashi, Hiroshi, 4,985,155, Cl. 252-8.600.
Ohashi, Kunio, to Sharp Kabushiki Kaisha. Exposure method for forming latent images. 4,985,728, Cl. 355-77.000.
Ohashi, Mitsuo; Awano, Katsuya; Tanaka, Toshio; and Kimura, Tetsuya, to Kyorin Pharmaceutical Co., Ltd. Phenoxyalkylcarboxylic acid derivatives and process for their preparations. 4,985,585, Cl. 560-9.000.
Ohba, Hiroki; Koshi, Makoto; and Kumasaka, Norihiro, to Fujitsu Limited. Method of deelectrification in an electrophotographic apparatus. 4,985,730, Cl. 355-208.000.
Ohba, Toshio: *See*—
Yamada, Koichiro; Tanaka, Masaki; Ohba, Toshio; and Ohashi, Hiroshi, 4,985,155, Cl. 252-8.600.
Ohkawa, Kideki; Ozawa, Norio; and Matsubara, Motonari, to Kabushiki Kaisha Toshiba. Information storage medium. 4,985,349, Cl. 430-495.000.
Ohki, Junichi: *See*—
Koga, Toshio; Ohki, Junichi; Ohta, Mutsumi; and Kunihiro, Hideto, 4,985,782, Cl. 358-335.000.
Ohkubo, Keisuke: *See*—
Takemura, Tetsu; Ichinose, Hidetoshi; Ohkubo, Keisuke; Sugitani, Akihiko; and Okamoto, Toshiyuki, 4,985,275, Cl. 427-106.000.
Ohlendorf, Dieter: *See*—
Wingen, Rainer; Dubal, Hans-Rolf; Hemmerling, Wolfgang; Muller, Ingrid; and Ohlendorf, Dieter, 4,985,172, Cl. 252-299.670.
Ohlschlager, Hans: *See*—
Matejec, Reinhart; Odenwalder, Heinrich; Ohlschlager, Hans; and Wolff, Erich, 4,985,351, Cl. 430-598.000.
Ohmi, Tadahiro: *See*—
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,985,738, Cl. 357-22.000.
Ohmine, Toshinori: *See*—
Takiguchi, Yo; Tani, Tokio; Kawashima, Ichiro; Ohsumi, Jun; Furukawa, Hidehiko; and Ohmine, Toshinori, 4,985,361, Cl. 435-218.000.
Ohmori, Hiroshi: *See*—
Nishio, Takeyoshi; Yamauchi, Shinichi; Arashiro, Yusuke; Ohno, Kenyu; Yokoyama, Masuzo; Nakano, Hiroshi; Ohmori, Hiroshi; Mayumi, Junji; and Kihira, Michiharu, 4,985,495, Cl. 525-68.000.
Ohmori, Michio: *See*—
Horie, Shinji; Shimizu, Hideto; Ohmori, Michio; and Yui, Hiroshi, 4,984,326, Cl. 15-256.500.
Ohmure, Yukio; Kashiwagi, Hiroshi; Fujiwara, Katsuki; Tsuchiya, Tatsumi; and Aoyama, Hirokazu, to Daikin Industries, Ltd. Working fluids. 4,985,168, Cl. 252-67.000.
Ohnemuller, Hans: *See*—
Leiber, Heinz; Ohnemuller, Hans; Kastner, Klaus; and Richter, Karl-Heinz, 4,984,649, Cl. 180-197.000.
Ohno, Kenyu: *See*—
Nishio, Takeyoshi; Yamauchi, Shinichi; Arashiro, Yusuke; Ohno, Kenyu; Yokoyama, Masuzo; Nakano, Hiroshi; Ohmori, Hiroshi; Mayumi, Junji; and Kihira, Michiharu, 4,985,495, Cl. 525-68.000.
Ohno, Shigeru: *See*—
Kitatani, Katsuji; Makino, Naonori; Hoshi, Satoshi; Sato, Hideo; and Ohno, Shigeru, 4,985,324, Cl. 430-56.000.
Ohno, Tadayoshi: *See*—
Hosaka, Yasuo; and Ohno, Tadayoshi, 4,985,716, Cl. 346-159.000.
Ohno, Yasuaki: *See*—
Sano, Shoichi; Furukawa, Yoshimi; Takei, Akihiko; Nishi, Yutaka; and Ohno, Yasuaki, 4,984,646, Cl. 180-79.100.
Ohno, Yotaro; Matsuura, Masahiro; Sato, Kenkichi; and Fukuyo, Hiroshi, to Nippon Kokan Kabushiki Kaisha. Method for manufacturing chromium-bearing pig iron. 4,985,075, Cl. 75-460.000.
Ohoka, Masaharu: *See*—
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizou, 4,985,362, Cl. 435-226.000.
Ohshima, Masayuki: *See*—
Hayakawa, Isao; Atarashi, Shohgo; Imamura, Masazumi; Yokohama, Shuichi; Higashihashi, Nobuyuki; Sakano, Katsuichi; and Ohshima, Masayuki, 4,985,557, Cl. 540-598.000.
Ohshima, Yoshio; Watanabe, Tsunekazu; Watanabe, Keizaburo; Nonoyama, Noboru; Kitazume, Masayoshi; and Tomita, Yukihiro, to Public Works Research Institute, Ministry of Construction; Kabushiki Kaisha Yakult Honsha; and Fujita Corporation. Anaerobic digestion method. 4,985,149, Cl. 210-603.000.
Ohsumi, Jun: *See*—
Takiguchi, Yo; Tani, Tokio; Kawashima, Ichiro; Ohsumi, Jun; Furukawa, Hidehiko; and Ohmine, Toshinori, 4,985,361, Cl. 435-218.000.
Ohsumi, Tadashi: *See*—
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Yano, Toshihiko; Fujimoto, Izumi; and Takada, Yoji, 4,985,460, Cl. 514-594.000.
Ohsumi, Yoshihiro: *See*—
Saito, Chuichi; Ojima, Kazuhira; and Ohsumi, Yoshihiro, 4,984,673, Cl. 198-333.000.
Ohta, Kenji; Takahashi, Akira; Katayama, Hiroyuki; Hirokane, Junji; and Murakami, Yoshiteru, to Sharp Kabushiki Kaisha. Optical memory device. 4,985,885, Cl. 369-275.100.
Ohta, Mitsuru: *See*—
Sakai, Jun; and Ohta, Mitsuru, 4,985,727, Cl. 355-27.000.
Ohta, Mutsumi: *See*—
Koga, Toshio; Ohki, Junichi; Ohta, Mutsumi; and Kunihiro, Hideto, 4,985,782, Cl. 358-335.000.
Ohta, Tomohisa; Hagiwara, Hiroyuki; Kanbara, Hisashige; Dobashi, Akihiko; and Seki, Yasuyuki, to Hitachi Chemical Company Ltd. Radiation curable pressure sensitive adhesive composition. 4,985,471, Cl. 522-27.000.
Ohta, Wasaburo: *See*—
Yagawara, Shinji; Ohta, Wasaburo; and Manaka, Junji, 4,984,446, Cl. 73-31.060.
Ohta, Yoshimasa; and Arakawa, Masayasu, to Honda Giken Kogyo Kabushiki Kaisha. Method of and apparatus for emergency shutdown of production line. 4,984,349, Cl. 29-430.000.
Ohtani, Toshihiro: *See*—
Osada, Noriyuki; Hisabe, Yasushi; Ohtani, Toshihiro; and Kanamori, Toshiya, 4,984,881, Cl. 350-616.000.
Ohtomo, Tsuyoshi: *See*—
Yano, Shinji; Kawamata, Akira; Minematsu, Yoshihiro; Akazaki, Shuichi; Zama, Mitsuko; Imokawa, Genji; Takaishi, Naotake; Ohtomo, Tsuyoshi; and Komori, Takashi, 4,985,547, Cl. 536-4.100.
Ohuchi, Kiyoyuki; Nakazawa, Yoshinori; and Matsuno, Kenichi, to Agency of Industrial Science and Technology, Ministry of International Trade and Industry. Ceramic isothermal forging die. 4,984,445, Cl. 72-360.000.
Oike, Katsumi, to Sanden Corporation. Article dispensing mechanism for cylindrical articles. 4,984,710, Cl. 221-242.000.
Oishi, Kengo: *See*—
Onmori, Shozo; Takahashi, Daisuke; and Oishi, Kengo, 4,985,798, Cl. 360-132.000.
Ojima, Kazuhira: *See*—
Saito, Chuichi; Ojima, Kazuhira; and Ohsumi, Yoshihiro, 4,984,673, Cl. 198-333.000.
Ojima, Kazuo: *See*—
Hamanaka, Naoki; Tanaka, Teruo; Omoda, Koichiro; Nagashima, Shigeo; Nakagoshi, Junji; and Ojima, Kazuo, 4,985,827, Cl. 364-200.000.
Ojima, Masahiro: *See*—
Saito, Atsushi; Ojima, Masahiro; and Ito, Masaru, 4,985,881, Cl. 369-13.000.
Oka, Hideki: *See*—
Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, 4,985,623, Cl. 250-231.160.
Oka, Mitsuru: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Unno, Ryoichi; Matsumoto, Yukiharu; Kimura, Hiromoto; Oka, Mitsuru; and Sawai, Kiichi, 4,985,569, Cl. 548-453.000.
Okabe, Naoto: *See*—
Tokura, Norihito; Ito, Hiroyasu; and Okabe, Naoto, 4,985,743, Cl. 357-39.000.
Okada, Chiaki: *See*—
Kumagai, Yuugo; Tan, Ryouji; Ikeda, Takashi; Fujii, Tetsuya; Okada, Chiaki; Higashida, Osamu; Sugitani, Hatuo; and Fukasawa, Masato, 4,985,328, Cl. 430-110.000.
Okada, Hisashi: *See*—
Hirano, Mitsunori; Hirano, Masato; Yagihara, Morio; and Okada, Hisashi, 4,985,348, Cl. 430-434.000.
Sakai, Minoru; Katoh, Kazunobu; Yamaguchi, Jiro; Okada, Hisashi; Yasuda, Tomokazu; and Satake, Masaki, 4,985,338, Cl. 430-264.000.
Okada, Moritami: *See*—
Satoh, Shuichi; Tsuji, Kazuwo; Nakashima, Takeru; Yazu, Shuji; Nisida, Yosio; Muro, Kiyofumi; Demizu, Yuzo; Nakagawa, Masuo; and Okada, Moritami, 4,985,226, Cl. 423-446.000.
Okada, Osamu; Takami, Susumu; Kotani, Tamotu; Mori, Satoshi; Fujita, Hiroki; Fukumura, Naoko; and Ippommatsu, Masamichi, to Osaka Gas Company Limited. Process for producing a desulfurization agent. 4,985,074, Cl. 75-444.000.
Okamoto, Tatsuo: *See*—
Watakabe, Yaichiro; Okamoto, Tatsuo; and Matsuda, Shuichi, 4,985,319, Cl. 430-5.000.

Okamoto, Teiji: *See—*
Tsuboi, Yukitoshi; and Okamoto, Teiji, 4,985,784, Cl. 358-342.000.
Okamoto, Toshiyuki: *See—*
Takemura, Tetsu; Ichinose, Hidetoshi; Ohkubo, Keisuke; Sugitani, Akihiko; and Okamoto, Toshiyuki, 4,985,275, Cl. 427-106.000.
Okamoto, Yoshifumi, to Canon Kabushiki Kaisha. Output apparatus. 4,985,850, Cl. 364-519.000.
Okamura, Masami; and Sawa, Takao, to Kabushiki Kaisha Toshiba. Fe-based soft magnetic alloy product. 4,985,088, Cl. 148-305.000.
Okano, Kazuyuki: *See—*
Tabata, Munehiro; Hayashi, Chiharu; Isozaki, Yasuhito; Okano, Kazuyuki; and Hasegawa, Yo, 4,985,071, Cl. 75-246.000.
Oki Electric Industry Co., Ltd.: *See—*
Fukui, Tsutomu; Koike, Hideto; and Ayukai, Kemmi, 4,985,636, Cl. 250-559.000.
Utunomiya, Jiro; Iida, Saburo; Sibuya, Hitosi; Kusaba, Kazunori; and Narumi, Isao, 4,985,747, Cl. 357-68.000.
Okihara, Yoshihiko; and Arita, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Output buffer semiconductor and method for controlling current flow in an output switching device. 4,985,644, Cl. 307-443.000.
Okonogi, Shigeo; Tomita, Mamoru; Shimamura, Seiichi; Tomimura, Toshio; Ishibashi, Norio; Miyakawa, Hiroshi; and Sugawara, Koichi, to Morinaga Milk Industry Co., Ltd. Composition of feedstuff. 4,985,246, Cl. 424-115.000.
Okubo, Satoru: *See—*
Shimomura, Setsuhiro; Wataya, Seiji; Nishimura, Yukinobu; and Okubo, Satoru, 4,984,546, Cl. 123-425.000.
Okudaira, Sadayuki; Kawakami, Hiroshi; Kure, Tokuo; Tsujimoto, Kazunori; and Tachi, Shinichi, to Hitachi, Ltd. Dry etching by alternately etching and depositing. 4,985,114, Cl. 156-643.000.
Okuma, Atsushi: *See—*
Mochizuki, Shuji; Okuma, Atsushi; and Haruna, Katsunori, 4,985,523, Cl. 526-301.000.
Okumura, Yoshinori: *See—*
Ishii, Tatsuya; Okumura, Yoshinori; and Nagatomo, Masao, 4,985,368, Cl. 437-038.000.
Oldfield, John: *See—*
Hughes, Leslie R.; Oldfield, John; and Pegg, Stephen J., 4,985,441, Cl. 514-260.000.
Oldham, Samuel R.: *See—*
Critchley, Richard J.; and Oldham, Samuel R., 4,984,510, Cl. 98-1.000.
Olin Corporation: *See—*
Reisch, John W., 4,985,491, Cl. 524-875.000.
Ollanik, Steven J.: *See—*
Bajpai, Atul; Marczewski, Richard W.; Marek, Melissa M.; Shrivastava, Anil B.; Amble, Charles S.; Joyce, Robert H.; Kishore, Nanda; and Ollanik, Steven J., 4,985,857, Cl. 364-551.010.
Olson, Lawrence E.: *See—*
Sather, Keith O.; Gade, Edward R.; Tandeski, David A.; and Olson, Lawrence E., 4,984,360, Cl. 29-890.053.
Olympus Optical Co., Ltd.: *See—*
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 4,984,575, Cl. 128-660.030.
O'Malley, James. Trash container supporting apparatus. 4,984,704, Cl. 220-23.400.
Omniglass Ltd.: *See—*
Davies, Lawrence W., 4,984,402, Cl. 52-398.000.
Omoda, Koichiro: *See—*
Hamanaka, Naoki; Tanaka, Teruo; Omoda, Koichiro; Nagashima, Shigeo; Nakagoshi, Junji; and Ojima, Kazuo, 4,985,827, Cl. 364-200.000.
Omote, Hiroki; and Kataoka, Hideaki, to Fuji Photo Film Co., Ltd. Self-processing film unit. 4,985,335, Cl. 430-209.000.
Omron Tateisi Electronics Co.: *See—*
Kobayashi, Toshiyuki; Makita, Shigeru; and Ota, Hiroyuki, 4,984,895, Cl. 356-423.000.
Oncken, John E., to First City, Texas- N. A. Extended coverage monetary regulation system. 4,985,833, Cl. 364-408.000.
Onda, Yuzi: *See—*
Saito, Masao; Tsukahara, Kengo; Takahashi, Noriko; and Onda, Yuzi, 4,985,581, Cl. 558-327.000.
O'Neill, Michael J., to Perkin-Elmer Corporation, The. Circuitry for measuring phase difference between two oscillatory signals. 4,985,683, Cl. 328-133.000.
O'Neill, Michael J.: *See—*
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,984,417, Cl. 56-11.300.
O'Neill, R. Kevin, to Calmar, Inc. Closure assembly having an axially movable liquid dispenser. 4,984,920, Cl. 401-127.000.
Onishi, Masayoshi; and Ozawa, Hiromasa, to Mitsubishi Denki Kabushiki Kaisha. Electrically-powered drive apparatus. 4,984,668, Cl. 192-84.00C.
Onmori, Shozo; Takahashi, Daisuke; and Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic tape cassette having improved dust proofing. 4,985,798, Cl. 360-132.000.
Onninen Oy: *See—*
Jarvinen, Pekka, 4,984,962, Cl. 414-786.000.
Ono, Kohei; Satoh, Hitoshi; and Kutsuma, Masako, to Nihon Kohden Corporation. Method of and apparatus for driving a dot array recorder. 4,985,852, Cl. 364-519.000.
Ono, Koji, to Kabushiki Kaisha Toshiba. Radio telephone device. 4,985,912, Cl. 379-61.000.
Ono, Takuhiro: *See—*
Furuya, Nobuaki; Ono, Takuhiro; Horiuchi, Naoya; Yamanaka, Keiichro; and Miyata, Takeo, 4,985,898, Cl. 372-106.000.
Ooe, Takashi; Ogawa, Shinji; Miura, Akiko; and Itatani, Ryohei, to Mitsui Toatsu Chemicals, Inc. Exhaust gas treating apparatus. 4,985,213, Cl. 422-186.010.
Oohara, Kouji: *See—*
Hayakawa, Kunio; Furuya, Hiromi; Shimada, Hisanori; Nakata, Masahiro; Kodera, Kaoru; Oohara, Kouji; and Akagi, Nobuo, 4,985,345, Cl. 430-335.000.
Oohara, Minoru: *See—*
Sugita, Norifumi; Niimura, Koichi; Oguchi, Yoshiharu; Hirose, Kunitaka; Matsunaga, Kenichi; Oohara, Minoru; Muto, Shigeaki; Kakuchi, Junji; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 4,985,543, Cl. 530-396.000.
Oohira, Eiji: *See—*
Ichikawa, Akira; Asakawa, Yoshiaki; Komatsu, Akio; and Oohira, Eiji, 4,985,923, Cl. 381-38.000.
Oosawa, Shin-ichi: *See—*
Shimoda, Kenji; and Oosawa, Shin-ichi, 4,985,755, Cl. 358-22.000.
Oota, Junichi: *See—*
Ogura, Kuniaki; Oota, Junichi; Abe, Teruyoshi; and Takajo, Shigeaki, 4,985,309, Cl. 428-570.000.
Ootani, Mikio: *See—*
Koishi, Toshio; Ootani, Mikio; Katsuragawa, Seichi; and Sueta, Hideaki, 4,985,519, Cl. 526-249.000.
Orbisphere Laboratories, Inc.: *See—*
Hale, John M., 4,985,130, Cl. 204-415.000.
Orejola, Wilmo C. Ventricular venting loop. 4,985,014, Cl. 600-16.000.
Orii, Makoto; and Iwashita, Hiroyuki, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Speed governor for toilet or the like. 4,984,666, Cl. 192-7.000.
Ortiz, Angel L., Jr., to General Electric Company. Method and apparatus for high power optical fiber injection and alignment. 4,984,885, Cl. 356-153.000.
Ortman, Chet B.; and Ortman, Jennifer L. Pregnancy pillow with inflatible bladder. 4,984,315, Cl. 5-431.000.
Ortman, Jennifer L.: *See—*
Ortman, Chet B.; and Ortman, Jennifer L., 4,984,315, Cl. 5-431.000.
OSA AB: *See—*
Herolf, Olof, 4,984,961, Cl. 414-786.000.
Osada, Noriyuki; Hisabe, Yasushi; Ohtani, Toshihiro; and Kanamori, Toshiya, to Ebara Corporation. Rotation supporting device of a polygon mirror. 4,984,881, Cl. 350-616.000.
Osaka Gas Company Limited: *See—*
Okada, Osamu; Takami, Susumu; Kotani, Tamotu; Mori, Satoshi; Fujita, Hiroki; Fukumura, Naoko; and Ippommatsu, Masamichi, 4,985,074, Cl. 75-444.000.
Osaki, Akira: *See—*
Ishihara, Heigo; Osaki, Akira; Nagashiro, Waichi; and Maeda, Fuzio, 4,985,295, Cl. 428-213.000.
Oshitani, Masahiko; Hasegawa, Keiichi; and Yufu, Hiroshi, to Yuasa Battery Co., Ltd. Alkaline battery with a nickel electrode. 4,985,318, Cl. 429-223.000.
Ota, Hiroyuki: *See—*
Kobayashi, Toshiyuki; Makita, Shigeru; and Ota, Hiroyuki, 4,984,895, Cl. 356-423.000.
Ota, Kiyoshi: *See—*
Arai, Kazuo; Ota, Kiyoshi; and Wakiyama, Kouji, 4,985,786, Cl. 360-70.000.
Ota, Yoshiyuki, to Pilot Ink Co., Ltd. Liquid applicator with axial value actuation. 4,984,923, Cl. 401-279.000.
Otis Elevator Company: *See—*
Sansevero, Frank; and Nguyen, Dat, 4,984,671, Cl. 198-328.000.
Otis Engineering Corporation: *See—*
Reesing, David L., 4,984,631, Cl. 166-115.000.
Otsubo, Toru; Tokuda, Mitsuo; Yamaguchi, Yasuhiro; Sasaki, Ichirou; Ohara, Kazuhiro; Usuami, Hirohisa; and Azuma, Junzou, to Hitachi, Ltd. Apparatus for plasma processing. 4,985,109, Cl. 156-345.000.
Ott, Karl-Heinz: *See—*
Eckel, Thomas; Wittmann, Dieter; Leitz, Edgar; Schoeps, Jochen; Ott, Karl-Heinz; and Peters, Horst, 4,985,493, Cl. 525-67.000.
Wittmann, Dieter; Eckel, Thomas; Ott, Karl-Heinz; Damrath, Volker; and Westeppe, Uwe, 4,985,492, Cl. 525-63.000.
Ottman, Rick; Wiberg, Don; Johnson, Jack; Wanke, Thomas S.; and Davis, Thomas W., to Milwaukee School of Engineering. Fluid paper demonstration facility. 4,984,989, Cl. 434-401.000.
Oudet, Claude; and Prudham, Daniel, to Moving Magnet Technologies S.A. Single-phased angular electromagnetic actuator. 4,985,652, Cl. 310-15.000.
Owen, Charles W.: *See—*
Bianco, Frank J.; Owen, Charles W.; and Talamas, Elie, Jr., 4,985,632, Cl. 250-372.000.
Owens, Connie S. Indicator lid apparatus. 4,985,879, Cl. 368-89.000.
Owens-Illinois Closure Inc.: *See—*
Burzynski, Dennis J., 4,984,703, Cl. 215-350.000.
Owens, Peter J.: *See—*
Derr, W. Rodman, Jr.; Owens, Peter J.; and Sarli, Michael S., 4,985,134, Cl. 208-89.000.
Oxford, Alexander W.: *See—*
North, Peter C.; Oxford, Alexander W.; Coates, Ian H.; and Beswick, Paul J., 4,985,422, Cl. 514-215.000.
Oxford Magnet Technology Limited: *See—*
McDougall, Ian L., 4,985,679, Cl. 324-318.000.

Oxley, Donald W.: *See*—
Thatte, Satish M.; and Oxley, Donald W., 4,985,829, Cl. 364-200.000.

Oxley, Jeffery A.: *See*—
Niaura, Vitas; Oxley, Jeffery A.; and Tarika, Elio E., 4,985,260, Cl. 426-87.000.

Oy Iampella AB: *See*—
Ahonen, Heikki; Kenakkala, Timo; and Kokkonen, Pertti, 4,985,081, Cl. 106-772.000.

Oya, Yuichiro, to Sharp Kabushiki Kaisha. High frequency heating apparatus having detachable rotatable skewer. 4,985,607, Cl. 219-10.55E.

Ozaki, Atsushi: *See*—
Nagayama, Yasuji; and Ozaki, Atsushi, 4,985,641, Cl. 307-272.300.

Ozawa, Hiromasa: *See*—
Onishi, Masayoshi; and Ozawa, Hiromasa, 4,984,668, Cl. 192-84.00C.

Ozawa, Hiroshi: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,573, Cl. 549-402.000.

Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,574, Cl. 549-402.000.

Ozawa, Norio: *See*—
Ohkawa, Kideki; Ozawa, Norio; and Matsubara, Motonari, 4,985,349, Cl. 430-495.000.

Ozawa, Tetsuo: *See*—
Miura, Konoe; Ozawa, Tetsuo; and Kanaya, Junko, 4,985,171, Cl. 352-299.100.

Pac-Fasteners, (an affiliate of Peterson American Corporation): *See*—
Reynolds, Richard L., 4,984,319, Cl. 10-86.00A.

Pacanski, Jan. Weighted tennis/racquetball racket. 4,984,792, Cl. 273-73.00C.

Pacific Scientific Company: *See*—
Sommer, Holger T., 4,984,889, Cl. 356-336.000.

Paegelow, David G.: *See*—
Voith, Donald J.; Paegelow, David G.; and Jagodzinski, John E., 4,984,629, Cl. 165-95.000.

Pakull, Ralf; Freitag, Dieter; Eckhardt, Volker; Idel, Karsten-Josef; and Westeppe, Uwe, to Bayer Aktiengesellschaft. Thermotropic polyesters, a process for their production and their use for the production of moldings, filaments and films. 4,985,532, Cl. 528-190.000.

Palazzotto, Michael C.; and DeVoe, Robert J., to Minnesota Mining and Manufacturing Company. Energy curable compositions: two component curing agents. 4,985,340, Cl. 430-270.000.

Pan, Ali, to Northern Telecom Limited. Method and apparatus for forming metal shield from tape. 4,984,357, Cl. 29-828.000.

Pankove, Jacques I., to University of Colorado Foundation, Inc. High temperature semiconductor devices having at least one gallium nitride layer. 4,985,742, Cl. 357-34.000.

Panos, Rodney M.: *See*—
Balban, Morton S.; Lan, Ming-Shong; and Panos, Rodney M., 4,984,773, Cl. 270-5.000.

Parish, James M., to SMR Technologies, Inc. Railroad car diaphragm assembly. 4,984,522, Cl. 105-15.000.

Parker, Douglas E.; and Logsdail, Dennis H., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for the United Kingdom Atomic Energy Authority in Her Britannic Majesty's Government of the. Liquid-liquid contactor columns. 4,985,141, Cl. 210-90.000.

Parker, Robert M.: *See*—
Knoedler, Roy E.; Au, William G.; and Parker, Robert M., 4,984,845, Cl. 297-250.000.

Parriaux, Olivier; Neuman, Victor; and Voirin, Guy, to Centre Suisse d'Electronique et de Microtechnique SA. Force meter with optical waveguide integrated in a substrate. 4,984,863, Cl. 350-96.110.

Parulekar, Vivekanand: *See*—
Moser, Mark D.; Lawson, R. J.; Wang, Li; Parulekar, Vivekanand; Peer, Roger L.; and Hamlin, Charles R., 4,985,132, Cl. 208-65.000.

Pasternak, Mordechai, to Texaco Inc. Process for treating a charge containing dewaxing solvent and dewaxed oil. 4,985,138, Cl. 208-308.000.

Patrick, M. Fuertes; and Guy, M. Fleche, to Roquette Freres. Process for the oxidation of di-, tri-, Oligo- and polysaccharides into polyhydroxycarboxylic acids, catalyst used and products thus obtained. 4,985,553, Cl. 536-124.000.

Patte, Philippe; and Cordier, Andre, to Air Industrie Systemes. Device for purifying contaminated gas. 4,985,056, Cl. 55-240.000.

Patton, Robert L.: *See*—
Lok, Brent M. T.; Marcus, Bonita K.; Vail, Lawrence D.; Flanigen, Edith M.; Patton, Robert L.; and Wilson, Stephen T., 4,985,151, Cl. 210-689.000.

Paul, Norman C.: *See*—
Millar, Ross W.; Paul, Norman C.; and Richards, David H., 4,985,584, Cl. 558-483.000.

Pauly, John M., to Leland Stanford Junior University, The Board of Trustees of the. Magnetic resonance imaging and spectroscopy using an excitation pulse for multiple-dimensional selectivity. 4,985,677, Cl. 324-309.000.

Peacock, Lawrence L. Device and method for selecting random numbers for playing lottery games. 4,984,796, Cl. 273-142.00E.

Peak Systems, Inc.: *See*—
Crowley, John L.; Kermani, Ahmad; Lassig, Stephan E.; Johnson, Noel H.; and Rickords, Gary R., 4,984,902, Cl. 374-1.000.

Pean, Jean-Louis: *See*—
Duboc, Soraya; Renon, Henri; Laugier, Serge; Mizandjian, Jean-Luc; and Pean, Jean-Louis, 4,985,265, Cl. 426-425.000.

Pease, Kevin J.; Copella, Robert A.; and Flannery, Ann M., to Rand McNally & Company. Object verification apparatus and method. 4,985,614, Cl. 235-440.000.

Pedersen, Gunnar; and Norgard, Flemming, to Pedersen, Gunnar. Smoke chamber for fireplace. 4,984,562, Cl. 126-500.000.

Peelle Company, The: *See*—
Peelle, H. E., Jr.; Chang, I-Lin; and Walkowiak, Stefan, 4,984,658, Cl. 187-58.000.

Peelle, H. E., Jr.; Chang, I-Lin; and Walkowiak, Stefan, to Peelle Company, The. Car gate reversing edge. 4,984,658, Cl. 187-58.000.

Peer, Roger L.: *See*—
Moser, Mark D.; Lawson, R. J.; Wang, Li; Parulekar, Vivekanand; Peer, Roger L.; and Hamlin, Charles R., 4,985,132, Cl. 208-65.000.

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Pelkey, Gary L., to Wegener Communications, Inc. Remote controlled receiving system apparatus and method. 4,985,895, Cl. 371-37.700.

Penneck, Richard J.; O'Brien, James M.; Duckworth, Stephen J.; and Smith, Nicholas J. G., to Raychem Limited. Wire and cable. 4,985,313, Cl. 428-627.000.

Penney, Bruce J., to Triquint Semiconductor, Inc. Analog to digital converter with second order error correction. 4,985,702, Cl. 341-118.000.

Pennington, Donald C., Jr.; and Knox, John D., to Vermont American Corporation. Drill Bit for masonry and rock drill. 4,984,944, Cl. 408-223.000.

Peppel, George W.; and Sullivan, Paul E., to Lockheed Corporation. Concentric piping flex joint. 4,984,827, Cl. 285-133.100.

Perez, Miguel, to Bendix France. Brake booster with adjustable jump. 4,984,506, Cl. 91-369.200.

Perkin-Elmer Corporation, The: *See*—
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O'Neill, Michael J., 4,985,683, Cl. 328-133.000.

Perlant, Sigmund. Container support with improved bag holding means. 4,984,759, Cl. 248-99.000.

Pernelle, Andre; and Desbiolles, Jack, to Salomon S.A. Golf club capable of selective angle modification between the shaft and head, and method of assembling the golf club. 4,984,794, Cl. 273-80.100.

Perry, John G.; and Spelyng, Walter A., to BASF Corporation. Process for purification of catalysts from polyols using ion exchange resins. 4,985,551, Cl. 536-18.600.

Persaud, Harvey. Back massaging device. 4,984,568, Cl. 128-51.000.

Pessier, Rudolf C. O.: *See*—
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Peters, Horst: *See*—
Eckel, Thomas; Wittmann, Dieter; Leitz, Edgar; Schoeps, Jochen; Ott, Karl-Heinz; and Peters, Horst, 4,985,493, Cl. 525-67.000.

Petersen, Thomas D. Universal modular prosthesis stem extension. 4,985,037, Cl. 623-20.000.

Peterson, Gary L.: *See*—
Botez, Dan; Jansen, Michael; Mawst, Luke J.; Peterson, Gary L.; Simmons, William W.; Wilcox, Jaroslava Z.; and Yang, Jane J. J., 4,985,897, Cl. 372-50.000.

Peterson, John L.; and Howell, John R. Hybrid vapor-compression/liquid desiccant air conditioner. 4,984,434, Cl. 62-94.000.

Peterson, Samuel F.; Hilger, Ronald O.; and Kalnins, William, to Associated Mills, Inc. Air bubbling mats for therapeutically agitating bath water. 4,984,583, Cl. 128-66.000.

Petroleo Brasileiro S.A. -Petrobras: *See*—
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Pettit, George R., to Arizona Board of Regents. Composition of matter for inhibiting leukemias and sarcomas. 4,985,436, Cl. 514-287.000.

Pfaff, Gerhard: *See*—
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Pfaffmann, George D.; Kubis, Charles S.; Currie, John P.; Balzer, Norbert R.; Walter, John; and Adams, Graham R., to Continental Can Company, Inc. Apparatus and method for sealing a lid onto a container. 4,984,414, Cl. 53-478.000.

Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., to Visual Information Technologies, Inc. High speed image processing system using separate data processor and address generator. 4,985,848, Cl. 364-518.000.

Pfister GmbH: *See*—
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Hafner, Hans W., 4,984,468, Cl. 73-727.000.

Philip Morris Incorporated: *See*—
Stewart, Lawrence L., Jr., 4,984,588, Cl. 131-364.000.

Phillips, James L. Soils percolation testing apparatus. 4,984,447, Cl. 73-38.000.

Phillips, Ronald W., II, to B.F. Goodrich Company, The. Blind fastener. 4,984,946, Cl. 411-34.000.

Phillips, Wayne, to Fuqua Industries, Inc. (Snapper Division). Control system for a snow blower traction vehicle. 4,984,479, Cl. 74-480.00R.
Piacente, Patricia A.: *See—*
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Picker International, Inc.: *See—*
Gangarosa, Raymond E.; and Chui, K. Ming, 4,985,678, Cl. 324-318.000.
Zupancic, Anton Z.; Champa, Anthony A.; and Dobbs, John L., 4,984,774, Cl. 269-322.000.
Pickerrell, Daniel A.; and Inch, John, to Masco Corporation. Flush valve adjustable adapter. 4,984,312, Cl. 4-378.000.
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Piel, Joseph E., Jr.; and Smith, Lowell S., to General Electric Company. Ultrasound imaging system with common-mode noise rejection probe. 4,984,465, Cl. 73-602.000.
Pierce, Edward A.: *See—*
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Pierpont, Robert, to Specialty Packaging Licensing Company, Inc. Assembly for securing and sealing a dispenser to a flanged container. 4,984,702, Cl. 215-272.000.
Piezo Crystal Company, Division of PPA Industries, Inc.: *See—*
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Pilla, Jacques, to Dowell Schlumberger Incorporated. Logging of subterranean wells using coiled tubing. 4,984,634, Cl. 166-250.000.
Pilot Ink Co., Ltd.: *See—*
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Pioneer Electronic Corporation: *See—*
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Pipe Liners, Inc.: *See—*
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Pires, Valtair P. L.: *See—*
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Pitney Bowes Inc.: *See—*
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Pitters Pty. Ltd.: *See—*
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Pivonka, Ralph M. Portable barbeque grill cart. 4,984,515, Cl. 99-449.000.
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Garret, Claude; Guyon, Claude; Plau, Bernard; and Taurand, Gerard, 4,985,419, Cl. 514-211.000.
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Plunkett, Richard A. Comfortable binocular. 4,984,879, Cl. 350-551.000.
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Singer, Norman; Wilcox, Reed; Podolski, Joseph S.; Chang, Hsien-Hsin; Pookote, Suseelan; Dunn, John M.; and Hatchwell, Leora, 4,985,270, Cl. 426-515.000.
Pohl, Wolfgang D.: *See—*
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Polaroid Corporation: *See—*
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Toczyski, Zygmunt; Kruczynski, Stanislaw W.; Frackiewicz, Henryk; Lozinski, Janusz; Chlopek, Zdzislaw; Danilczyk, Wiktor; Ranachowski, Jerzy; Janula, Janusz; and Wolski, Lech, 4,984,550, Cl. 123-478.000.
Pollmann, Klaus: *See—*
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Polska Akademia Nauk Instytut Podstawowych Problemow Techniki: *See—*
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Polysar Limited: *See—*
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Ponjee, Johannes J.; and Tijburg, Rudolf P., to U.S. Philips Corporation. Method of manufacturing semiconductor laser device. 4,985,370, Cl. 437-129.000.
Pontiff, Thomas M.: *See—*
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Pookote, Suseelan: *See—*
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Poteat, S. Eugene: *See—*
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Pottebaum, Joseph R., to A. O. Smith Corporation. Heater with flame powered logic supply circuit. 4,984,981, Cl. 431-80.000.
Potter, Robert I., to Alum Rock Technology. Self correcting nozzle useful with current to pressure transducer. 4,984,600, Cl. 137-82.000.
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Powell, James W.; and Powell, James E. Fish feeding apparatus. 4,984,536, Cl. 119-51.040.
Powell, William D., Jr.: *See—*
Levinstein, Hyman J.; Powell, William D., Jr.; and Sinha, Ashok K., 4,985,373, Cl. 437-195.000.
Power, Brenda. Grease absorbent device. 4,984,907, Cl. 383-109.000.
Powers, Robert B. Elastomeric receptacle for nail clipper. 4,984,366, Cl. 30-124.000.
PPA Industries, Inc.: *See—*
Long, Bruce R., 4,985,687, Cl. 331-69.000.
Prakken, Bouwe. Device for transferring objects from a conveyor to a collection device. 4,984,677, Cl. 198-418.600.
Precision Pulley, Inc.: *See—*
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Precision Screen Machines, Inc.: *See—*
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Price, Daniel W., to Hasbro, Inc. Wrestler character figure. 4,985,008, Cl. 446-308.000.
Price, Jack A., to VLSI Technology, Inc. Static random access memory having column decoded bit line bias. 4,985,864, Cl. 365-189.060.
Prigent, Michel; Blanchard, Gilbert; Garreau, Francois; and Courty, Philippe, to Pro-Catalyse. Catalyst supports/catalysts for the treatment of vehicular exhaust gases. 4,985,387, Cl. 502-304.000.
Primary Delivery Systems, Inc.: *See—*
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Prince, Thomas F. Electric switch having reduced actuator play. 4,985,603, Cl. 200-341.000.
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Prinsloo, Willem J. C.; De Villiers, Pierre; and Van Dijken, Marten C., to Cyclofil (Proprietary) Limited. Vortex tube separating device. 4,985,058, Cl. 55-457.000.
Printronix, Inc.: *See—*
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Procter & Gamble Company, The: *See—*
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Neilson, Diane H. R.; Work, Sara L. R.; Whaley, Edward L.; Kirkpatrick, Steven J.; and McCarthy, James P., 4,985,271, Cl. 426-595.000.
Tanner, Paul R.; Nunn, Randolph G., Jr.; and Luebbe, John P., 4,985,238, Cl. 424-66.000.
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Proebsting, Robert J., to National Semiconductor Corporation. Speed enhancement technique for CMOS circuits. 4,985,643, Cl. 307-443.000.
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Provost, George A.; and Rocha, Gerald F., to Velcro Industries B.V. Hook for hook and loop fasteners. 4,984,339, Cl. 24-452.000.
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Pulyer, Yuly M.; and Mickle, Marlin H., to University of Pittsburgh. Contactless motion sensor. 4,985,691, Cl. 336-130.000.

Pum, Frank W.; and Szymaszek, Michael C., to Square D Company. Housing for a multi-board electronic module for a programmable controller system. 4,985,803, Cl. 361-383.000.

Punater, Dinesh G.: *See*—
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Purushothaman, Sampath: *See*—
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Putman, Gary W. Light for emergency use. 4,985,813, Cl. 362-186.000.

Quaker Chemical Corporation: *See*—
Buzby, John H.; and Evans, Robert D., 4,985,120, Cl. 162-199.000.

Quentin-Millet, Marie-Jose B.; and Arminjon, Francois, to Institut Merieux. Affinity chromatography material for antigens of the bacteria of the Bordetella genus. 4,985,144, Cl. 210-198.200.

R. Ancker Jorgensen A/S: *See*—
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R. I. Ph. Recherche Informatique et Pharmacie (S.A.R.L.): *See*—
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Rademachers, Jakob; Wilhelm, Volker; Keifer, Siegfried; and Burow, Wilfried, to Bayer Aktiengesellschaft. Thermostable zinc ferrite color pigments containing 0.05–0.5 wt % lithium, a process for their preparation and their use. 4,985,078, Cl. 106-419.000.

Rademachers, Jakob: *See*—
Naumann, Rolf; Rademachers, Jakob; and Rodi, Fritz, 4,985,073, Cl. 75-255.000.

Raghavan, Narasimha S.: *See*—
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Ramirez, Ray C.: *See*—
Laycock, John E.; and Ramirez, Ray C., 4,985,142, Cl. 210-130.000.

Ramsey, Edward. Lighted running board assembly. 4,985,810, Cl. 362-81.000.

Rana, Virendra V. S.; and Tsai, Nun-Sian, to AT&T Bell Laboratories. Process for making integrated-circuit device metallization. 4,985,371, Cl. 437-189.000.

Ranachowski, Jerzy: *See*—
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Rand McNally & Company: *See*—
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Rankin, William J.: *See*—
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Ransom, David: *See*—
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Rasshofer, Werner: *See*—
Rosthauser, James W.; Meckel, Walter; and Rasshofer, Werner, 4,985,490, Cl. 524-871.000.

Rattner, Manfred; and Plisek, Franz, to Siemens Aktiengesellschaft. Extracorporeal lithotriptor with x-ray locating system. 4,984,565, Cl. 128-24.0EL.

Rauner, Hans; Grauvogl, Erwin; Gerl, Gerhard; and Forster, Josef, to Siemens Aktiengesellschaft. Method for identifying and interrogating the measured value of the velocity or speed of an object. 4,985,859, Cl. 364-565.000.

Rautenberg, Horst: *See*—
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Ray, Sudipta K.: *See*—
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Raychem Limited: *See*—
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Raytheon Company: *See*—
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RCA Licensing Corporation: *See*—
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Recalde, Carlos E., to Sante Fe International Corporation. Pipeline laying system and vessel and method of spooling lines onto the vessel. 4,984,934, Cl. 405-168.000.

Reckziegel, Erich, to Henkel Kommanditgesellschaft auf Aktien. Continuous bookbinding process using a moisture curable polyurethane adhesive. 4,984,949, Cl. 412-8.000.

Redding, Warren E. Remote area golf ball retriever. 4,984,836, Cl. 294-66.100.

Redlich, George H.; and Novak, Ronald W., to Rohm and Haas Company. Microsuspension process for preparing solvent core sequential polymer dispersion. 4,985,064, Cl. 71-90.000.

Reed, Gordon K., to Process Automation Business, Inc. Apparatus for supplying temperature regulated air to a calender roll. 4,984,622, Cl. 165-47.000.

Reed, Herbert M.; Sager, Scott J.; Grebenyuk, Alexander; and Torchia, Stephen F., to Micromation Systems, Inc. Thin panel drilling method and apparatus. 4,984,352, Cl. 29-568.000.

Reed, Jack: *See*—
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Reesing, David L., to Otis Engineering Corporation. System and plug for plugging a conduit. 4,984,631, Cl. 166-115.000.

Refeka Werbemittel GmbH: *See*—
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Regan, Barbara R.: *See*—
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Reggiani, Romano: *See*—
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Reicks, Allen V.: *See*—
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Reidenbach, H. D.: *See*—
Melzer, Andreas; Naruhn, Markus; Kipfmuller, Karl; Reidenbach, H. D.; and Buess, Gerd, 4,985,030, Cl. 606-51.000.

Reinecke, Paul: *See*—
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Reinking, Klaus: *See*—
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Reisch, John W., to Olin Corporation. Polyurethane sealants made using high molecular weight polyols prepared with double metal cyanide catalysts. 4,985,491, Cl. 524-875.000.

Reiser, Peter; Steiert, Edwin; and Schaffert, Wolfgang, to Eberspacher, J. Heater for motor vehicles which can be operated on several power settings. 4,984,736, Cl. 237-2.00A.

Reist, Walter, to Ferag AG. Method of, and apparatus for, fabrication of portable tubular-shaped packages formed of printed products, such as newspapers, periodicals and the like. 4,984,411, Cl. 53-118.000.

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Rekers, John W.: *See*—
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Renard, Paul; and Sionnet, Jean, to Societe Industrielle de Combustible Nucleaire. Composite tool comprising a polycrystalline diamond active part. 4,984,642, Cl. 175-329.000.

Renard, Pierre; Simandoux, Jean-Claude; and Burzynski, Jean-Pierre, to Institut Francais du Petrole. Apparatus for injecting a hydrocarbon charge into a reactor. 4,985,209, Cl. 422-140.000.

Renaud, Croisy. Multiple function observation and treatment endoscope and preparation process. 4,984,563, Cl. 128-6.000.

Renfrow, Denny M.; Schumacher, Francis X.; and Helder, Edward R., to Hewlett-Packard Company. Logic edge timing generation. 4,985,639, Cl. 307-262.000.

Renon, Henri: *See*—
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Research-Cottrell, Inc.: *See*—
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Research Development Corporation: *See*—
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Research Development Corporation of Japan: *See*—
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Research Foundation of State University of New York, The: *See*—
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Reshell, Gregory G.: *See*—
Lemke, William E.; and Reshell, Gregory G., 4,984,786, Cl. 272-119.000.

Restle, Serge: *See*—
Maignan, Jean; Restle, Serge; and Lang, Gerard, 4,985,563, Cl. 544-320.000.

Reuter, Wolfgang, to Leybold Aktiengesellschaft. Charging appliance for melting units. 4,984,952, Cl. 414-180.000.

Reydams, Jean-Jacques: *See*—
Mertens, Guy; Reydams, Jean-Jacques; and Wasterlain, Michel, 4,985,099, Cl. 156-94.000.

Reynolds, Richard L., to Pac-Fasteners, (an affiliate of Peterson American Corporation). Method of manufacturing a laminated nut having cage with nested fingers. 4,984,319, Cl. 10-86.00A.

Reynolds, Timothy J.: *See*—
Williams, Alan; Wilson, John D.; Wragg, Roger D.; Jones, Stephen D.; Komodromos, Costa; and Reynolds, Timothy J., 4,985,385, Cl. 502-84.000.

Rhind, William G.; and Carder, Norman G., to Hewlett-Packard. Non-intrusive channel-impairment analyzer. 4,985,900, Cl. 375-10.000.

Rhone-Poulenc Chimie: *See*—
Bonin, Yves; and LeBlanc, Jack, 4,985,485, Cl. 524-403.000.
Leising, Frederic; and Torres, Ghislaine, 4,985,166, Cl. 252-62.540.
Michaud, Philippe; and Prud'Homme, Christian, 4,985,527, Cl. 528-26.000.
Mignani, Gerard; Barthelemy, Pascal; and Meyrueix, Remi, 4,985,528, Cl. 528-59.000.

Rhone-Poulenc Sante: *See*—
Garret, Claude; Guyon, Claude; Plau, Bernard; and Taurand, Gerard, 4,985,419, Cl. 514-211.000.

Ricard, Pernod: *See*—
Clauzure, Ande C., 4,985,264, Cl. 426-330.400.

Richard Wolf GmbH: *See*—
Boebel, Manfred; and Becker, Henning, 4,985,033, Cl. 606-148.000.

Melzer, Andreas; Naruhn, Markus; Kipfmuller, Karl; Reidenbach, H. D.; and Buess, Gerd, 4,985,030, Cl. 606-51.000.
Richards, David A., to Glaxo Group Limited. Pharmaceutical compositions. 4,985,418, Cl. 514-179.000.
Richards, David H.: *See*—
Millar, Ross W.; Paul, Norman C.; and Richards, David H., 4,985,584, Cl. 558-483.000.
Richards, Jonathan: *See*—
Simpson, Stuart M.; Garth, Peter; and Richards, Jonathan, 4,984,316, Cl. 5-508.000.
Richardson-Vicks, Inc.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,985,459, Cl. 514-561.000.
Richter Gedeon Vegyeszeti Gyar Rt: *See*—
Kreidl, Janos; Turcsanyi, Peter; Arcs nee Trischler, Zsuzsanna; Stefko, Bela; Meszaros nee Brill, Judit M.; Deutsch nee Juhasz, Ida; Szilbereky, Jeno ; Csizer, Eva; and Vezer, Szilard, 4,985,463, Cl. 514-646.000.
Richter, Karl-Heinz: *See*—
Leiber, Heinz; Ohnemuller, Hans; Kastner, Klaus; and Richter, Karl-Heinz, 4,984,649, Cl. 180-197.000.
Rickords, Gary R.: *See*—
Crowley, John L.; Kermani, Ahmad; Lassig, Stephan E.; Johnson, Noel H.; and Rickords, Gary R., 4,984,902, Cl. 374-1.000.
Ricoh Company, Ltd.: *See*—
Hayakawa, Kunio; Furuya, Hiromi; Shimada, Hisanori; Nakata, Masahiro; Kodera, Kaoru; Oohara, Kouji; and Akagi, Nobuo, 4,985,345, Cl. 430-335.000.
Horie, Shinji; Shimizu, Hideto; Ohmori, Michio; and Yui, Hiroshi, 4,984,326, Cl. 15-256.500.
Ito, Takanori, 4,985,759, Cl. 358-79.000.
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Tsuruoka, Ichiro; Takenouchi, Hiroaki; and Echigo, Katsuhiro, 4,985,733, Cl. 355-282.000.
Mori, Yasutomo; and Kurisu, Norio, 4,985,394, Cl. 503-226.000.
Serikawa, Yoshio, 4,985,725, Cl. 354-416.000.
Takiguchi, Yasuyuki; Kanemoto, Akihiko; Yokoi, Kenya; Iimura, Haruo; Enomoto, Takamichi; and Kamoi, Sumio, 4,984,873, Cl. 350-337.000.
Tsurukawa, Ikuya; and Sawabe, Kosaku, 4,985,719, Cl. 354-174.000.
Uemura, Hiroyuki; Suzuki, Akira; Shimada, Masaru; Mochizuki, Hidehiro; and Morohoshi, Naoya, 4,985,397, Cl. 503-227.000.
Yagawara, Shinji; Ohta, Wasaburo; and Manaka, Junji, 4,984,446, Cl. 73-31.060.
Ricoh Seiki Company, Ltd.: *See*—
Yagawara, Shinji; Ohta, Wasaburo; and Manaka, Junji, 4,984,446, Cl. 73-31.060.
Riddle, Dennis L., to Milliken Research Corporation. Preformed stair riser tile product. 4,985,095, Cl. 156-064.000.
Ridley, Gordon: *See*—
Dawson, Geoffrey G.; and Ridley, Gordon, 4,985,170, Cl. 252-117.000.
Riedel, Wolfgang; Wissler, Richard; Fichter, Otmar; Gregorius, Klaus; Mattauch, Gerhard; and Schorner, Heinz, to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V.; and Siemens Aktiengesellschaft. Device for the cooling of optoelectronic components and use of a flange joint used thereof. 4,985,805, Cl. 361-386.000.
Riedesser, Walter, to Julius Glatz GmbH. Wrapper for smoking article. 4,984,589, Cl. 131-365.000.
Riess, Jean: *See*—
Charpiot, Brigitte; Greiner, Jacques; Le Blanc, Maurice; Manfredi, Alexandre; Riess, Jean; and Zarif, Leila, 4,985,550, Cl. 536-18.400.
Rieter Machine Works, Ltd.: *See*—
Demuth, Robert, 4,984,395, Cl. 51-242.000.
Hanselmann, Daniel; Schlepfer, Walter; and Aebli, Jost, 4,984,336, Cl. 19-80.00R.
Rigler, Josef K.: *See*—
Bollenrath, Franz-Michael; and Rigler, Josef K., 4,984,899, Cl. 366-302.000.
Riker Laboratories, Inc.: *See*—
Hansen, Paul E.; and Libbey, Christopher J., 4,984,584, Cl. 128-898.000.
Riley, Ron, to J. N. Fauver Company, Inc. Conveyor control. 4,984,521, Cl. 104-290.000.
Rinesch, Rudolf: *See*—
Stadlbauer, Wilhelm, deceased; Koch, Erwin; Zauner, Franz; Rinesch, Rudolf; and Vanovsek, Wolfgang, 4,985,067, Cl. 75-10.100.
Ring Sights Worldwide Limited: *See*—
Scott, Fraser; and Budden, Raymond G., 4,984,370, Cl. 33-241.000.
Ringwood, Alfred E., to Australian National University, The. Diamond compacts. 4,985,051, Cl. 51-309.000.
Rische, Kenneth L.; Affeldt, Roger D.; and Urbanek, Edward A., Jr., to McGuane Industries. Thermal throttle actuator. 4,984,542, Cl. 123-179.00G.
Rist, Judith A. Cover for automotive seat restraint shield. 4,984,849, Cl. 297-482.000.
RIV-SKF Officine Di Villar Perosa S.p.A.: *See*—
Cogno, Pietro, 4,984,910, Cl. 384-563.000.
Robert Bosch GmbH: *See*—
Babitzka, Rudolf; Reiter, Ferdinand; and Romann, Peter, 4,984,744, Cl. 239-585.000.
Dominke, Peter, 4,985,839, Cl. 364-426.020.
Gotz, Eckart; Lerch, Hans-Reter; Dorsam, Thomas; Schweigert, Gerhard; Wittmann, Werner; and Korner, Michael, 4,985,845, Cl. 364-492.000.
Moser, Winfried, 4,984,551, Cl. 123-489.000.
Robertson, John A.: *See*—
Cyphert, David L.; and Robertson, John A., 4,985,715, Cl. 346-140.00R.
Rocha, Gerald F.: *See*—
Provost, George A.; and Rocha, Gerald F., 4,984,339, Cl. 24-452.000.
Rochat, Roxanna F.: *See*—
Taylor, Joann M.; McManus, Paul A.; Murch, Gerald M.; Rochat, Roxanna F.; and Weiman, Novia A., 4,985,853, Cl. 364-521.000.
Roche, Gaston, to Satcables (Societe en nom collectif). Optical fibre cable and method of making same. 4,984,869, Cl. 350-96.230.
Rock, Erich; and Hollenstein, Helmut, to Julius Blum Gesellschaft m.b.H. Fitting for fastening the rail member of a drawer. 4,984,929, Cl. 403-230.000.
Rockefeller University, The: *See*—
Fillit, Howard; Damle, Shridhar P.; Zabriskie, John; and Gregory, John D., 4,985,542, Cl. 530-395.000.
Rockwell International Corporation: *See*—
Balban, Morton S.; Lan, Ming-Shong; and Panos, Rodney M., 4,984,773, Cl. 270-5.000.
Vick, Gerald L., 4,984,872, Cl. 350-321.000.
Woods, Ralf D.; and Hooker, Brent D., 4,985,674, Cl. 324-158.00R.
Rode, Klaus; Mohr, Dieter; Frass, Werner; and Gersdorf, Joachim, to Hoechst Aktiengesellschaft. Photopolymerizable mixture, and a recording material produced therefrom. 4,985,341, Cl. 430-287.000.
Rodi, Fritz: *See*—
Naumann, Rolf; Rademachers, Jakob; and Rodi, Fritz, 4,985,073, Cl. 75-255.000.
Rodriguez, Rodrigo: *See*—
Husseiny, Abdo A.; Liang, Enju; and Rodriguez, Rodrigo, 4,985,824, Cl. 364-187.000.
Rodskier, Christian: *See*—
Nestvall, Per; and Rodskier, Christian, 4,985,005, Cl. 440-2000.000.
Roeder Industrial Holdings Limited: *See*—
Roeder, Ronald W. H.; and Brighton, Geoffrey, 4,985,192, Cl. 264-177.100.
Roeder, Ronald W. H.; and Brighton, Geoffrey, to Roeder Industrial Holdings Limited. Methods and apparatus for producing fastener profiles, and products incorporating the same. 4,985,192, Cl. 264-177.100.
Roeschlein, Eugene R., to United States of America, Navy. Solid state sequencing switch. 4,985,874, Cl. 367-122.000.
Rogers, Clarence L., Jr., to Uniroyal Goodrich Tire Company, The. Method for tire uniformity correction. 4,984,393, Cl. 51-165.00R.
Rohm GmbH Chemische Fabrik: *See*—
Siol, Werner, 4,985,504, Cl. 525-204.000.
Rohm and Haas Company: *See*—
Hsu, Adam C.; and Aller, Harold E., 4,985,461, Cl. 514-615.000.
Redlich, George H.; and Novak, Ronald W., 4,985,064, Cl. 71-90.000.
Rohr Industries, Inc.: *See*—
Cadwell, Gilbert C., 4,984,348, Cl. 29-423.000.
Hudson, Earl K.; Martinez, Romulo M.; and Woodward, James R., 4,984,732, Cl. 228-173.200.
Rohrmann, Jurgen; and Antberg, Martin, to Hoechst Aktiengesellschaft. Bisindenyl derivative, and a process for the preparation thereof. 4,985,576, Cl. 556-435.000.
Rolland, Laurence; Bertoochio, Rene ; and Cheron, Jacques, to Atochem, Gas de France; and Institut Francais du Petrole. Compositions based on chlorofluorinated ether and solvent and their application in absorption apparatus. 4,985,169, Cl. 252-69.000.
Roller, Johannes. Apparatus for processing cartridge cases. 4,984,501, Cl. 86-36.000.
Rolls-Royce Inc.: *See*—
Nightingale, Douglas J., 4,984,741, Cl. 239-265.170.
Rolls-Royce PLC: *See*—
Speak, Trevor H., 4,984,423, Cl. 60-39.310.
Roman, Paul F.: *See*—
Wilson, David T.; Dionesotes, Neil T.; and Roman, Paul F., 4,985,195, Cl. 264-320.000.
Romanelli, Michael G.: *See*—
Yezrielev, Albert I.; Romanelli, Michael G.; and Wellman, William E., 4,985,517, Cl. 526-208.000.
Romaniszyn, Eva: *See*—
Romaniszyn, Gregory; and Romaniszyn, Eva, 4,984,582, Cl. 128-844.000.
Romaniszyn, Gregory; and Romaniszyn, Eva. Vacuum assisted condom applicator. 4,984,582, Cl. 128-844.000.
Romann, Peter: *See*—
Babitzka, Rudolf; Reiter, Ferdinand; and Romann, Peter, 4,984,744, Cl. 239-585.000.
Root-Lowell: *See*—
Ellison, Garry L.; and Sears, Kim W., 4,984,742, Cl. 239-373.000.
Roques, Bernard P.: *See*—
Charpentier, Bruno; and Roques, Bernard P., 4,985,406, Cl. 514-11.000.
Roquette Freres: *See*—
Patrick, M. Fuertes; and Guy, M. Fleche, 4,985,553, Cl. 536-124.000.
Rose, Richard A.: *See*—
Davidson, Robert P.; and Rose, Richard A., 4,985,686, Cl. 330-124.00R.

Rosen, Charles A., to Cultured Foods Corporation. Pickling kit and process. 4,985,258, Cl. 426-8.000.
Ross, Stanley M. Rain chaps. 4,984,303, Cl. 2-227.000.
Rossman, Mitchell A.; and Bonham, James A., to Minnesota Mining and Manufacturing Company. Halomethyl-1,3,5-triazines containing an amine-containing moiety. 4,985,562, Cl. 544-209.000.
Rosthauser, James W.; Meckel, Walter; and Rasshofer, Werner, to Bayer Aktiengesellschaft; and Mobay Corporation. Method of direct manufacture of pigmented polyurethane powder. 4,985,490, Cl. 524-871.000.
Rothfuss, Hans: *See*—
Bruckner, Raimund; Eschner, Axel; Langenfeld, Wilhelm; Oberbach, Manfred; Rothfuss, Hans; and Stusser, Dieter, 4,984,769, Cl. 266-44.000.
Rubbermaid Incorporated: *See*—
Hanna, Thomas E.; and Brightbill, Keith E., 4,984,687, Cl. 206-373.000.
Rucker, Klaus G.; Simmons, Walter J.; and Stilwell, Larry T., to Du Pont de Nemours, E. I., and Company. Cutting torch. 4,985,610, Cl. 219-70.000.
Rudin, Alfred: *See*—
Chip, Gerald K.; and Rudin, Alfred, 4,985,469, Cl. 521-64.000.
Ruger, Walther, to Refeka Werbemittel GmbH. Magic card. 4,984,782, Cl. 272-8.00R.
Rullier, Pierre, to Salomon S.A. Safety binding. 4,984,816, Cl. 280-625.000.
Ryu, Shiro; Mochizuki, Kiyohumi; and Horiuchi, Yukio, to Kokusai Denshin Denwa Co., Ltd. Method for measuring dispersion characteristics of an optical fiber. 4,984,884, Cl. 356-73.100.
S.I.C.A.M.E. Societe Industrielle de Construction d'Appareils et de Material Electrique: *See*—
Francois, Pierre; and Prodel, Michel H. M. F., 4,985,003, Cl. 439-781.000.
S.N.E.I.A. Calbene: *See*—
Lepissier, Jean-Jacques, 4,984,828, Cl. 285-200.000.
S.T.E.P.: *See*—
Jouillat, Claude, 4,984,712, Cl. 222-95.000.
Saam, John C.: *See*—
Collins, Warde T.; Cottrell, Kenneth R.; and Saam, John C., 4,985,477, Cl. 523-212.000.
Sabarino, Giampiero: *See*—
Coassolo, Alfredo; Chapoy, L. Lawrence; Foa, Marco; and Sabarino, Giampiero, 4,985,533, Cl. 528-193.000.
Sabb, Annmarie L.; Abou-Gharbia, Magid A.; and Dionne, Gervais, to American Home Products Corporation. Pyridazino(4,5-b)indolizines. 4,985,560, Cl. 544-115.000.
Sadaoka, Yoshihiko: *See*—
Adachi, Ginya; Imanaka, Nobuhito; Aono, Hiromichi; Sugimoto, Eisuke; Sadaoka, Yoshihiko; Yasuda, Naoshi; Hara, Takeo; and Nagata, Masaki, 4,985,317, Cl. 429-191.000.
Saeki, Keiso; Shinozaki, Fumiaki; and Fujita, Yutaka, to Fuji Photo Film Co., Ltd. Multi-color recording materials. 4,985,331, Cl. 430-138.000.
Safford, George J.: *See*—
Woollatt, Derek; and Safford, George J., 4,984,361, Cl. 29-890.124.
Sagawa, Morikazu: *See*—
Eguchi, Kazuhiro; Ochiai, Eiichi; Ito, Shinichiro; Yoneda, Takehiko; Taki, Hiromitsu; Noguchi, Toshiharu; Kiyosue, Kuniaki; Yoshida, Akiro; Sagawa, Morikazu; and Makimoto, Mitsuo, 4,985,690, Cl. 333-222.000.
Sager, Scott J.: *See*—
Reed, Herbert M.; Sager, Scott J.; Grebenyuk, Alexander; and Torchia, Stephen F., 4,984,352, Cl. 29-568.000.
Sahashi, Masashi; Niu, Hiromi; and Inomata, Koichiro, to Kabushiki Kaisha Toshiba. Polycrystalline magnetic substances for magnetic refrigeration and a method of manufacturing the same. 4,985,072, Cl. 75-246.000.
Saigo, Takeshi; Tokuya, Tomohiko; Kamimura, Haruo; Hori, Mitsuaki; and Yasuoka, Hidenori, to Nippon Kokan Kabushiki Kaisha. Screw coupling joint. 4,984,829, Cl. 285-334.000.
Saint Gobain Vitrage: *See*—
Sauer, Gerd, 4,985,671, Cl. 323-282.000.
Saint-Gorbain Vitrage International: *See*—
Letemps, Bernard; and Dereims, Philippe, 4,985,059, Cl. 65-62.000.
Saita, Itsuro: *See*—
Arai, Masaru; and Saita, Itsuro, 4,984,325, Cl. 15-250.200.
Saito, Atsushi; Ojima, Masahiro; and Ito, Masaru, to Hitachi, Ltd. Record carrier for a magneto-optical disc memory having guide grooves of a plurality of tracks disposed with a predetermined relation to light spot diameter. 4,985,881, Cl. 369-13.000.
Saito, Chuichi; Ojima, Kazuhira; and Ohsumi, Yoshihiro, to Hitachi, Ltd. Step of passenger conveyor method of manufacturing same, and wavy metal plate. 4,984,673, Cl. 198-333.000.
Saito, Cyuichi; Ishida, Akio; Kaneko, Tatsuya; and Kimura, Toshihiko, to Hitachi, Ltd. Tread member for escalator or travelling road. 4,984,672, Cl. 198-333.000.
Saito, Hideo: *See*—
Takahashi, Takehiko; Saito, Hideo; Watanabe, Takashi; and Kaneko, Tomihioro, 4,984,813, Cl. 280-30.000.
Saito, Ken-Ichi: *See*—
Morita, Shuji; Saito, Ken-Ichi; Ninomiya, Kunihiro; Tobe, Akihiro; Nitta, Issei; and Sugano, Mamoru, 4,985,430, Cl. 514-253.000.
Saito, Masao; Tsukahara, Kengo; Takahashi, Noriko; and Onda, Yuzi, to Mitsubishi Gas Chemical Co., Inc. Catalyst and process for producing aromatic nitriles. 4,985,581, Cl. 558-327.000.
Saito, Masayuki; Yoshida, Keiji; and Hamada, Mitsuo, to Toray Silicone Company Ltd. Fluororubber composition containing dispersed particles of cured silicone material. 4,985,483, Cl. 524-265.000.
Saito, Muneo; Yamauchi, Yoshio; Kashiwazaki, Hiromi; Sugawara, Michiaki; and Hondo, Toshinobu, to Nihon Bunko Kogyo Kabushiki Kaisha. Pressure control apparatus and apparatus for effecting extraction chromatographic separation, and fractionation by employing the same. 4,984,602, Cl. 137-487.500.
Saito, Naohide; Shibuya, Shohei; and Inomata, Kentaro, to Nippon Oil Company, Ltd. Apparatus for measuring flash point of petroleum intermediate fraction and method for controlling flash point. 4,985,140, Cl. 208-347.000.
Saito, Seiji: *See*—
Ayata, Naoki; Sato, Yasushi; Saito, Seiji; Koumura, Noboru; and Fujii, Motoharu, 4,985,778, Cl. 358-296.000.
Saito, Tomoko: *See*—
Seko, Yasutoshi; and Saito, Tomoko, 4,985,816, Cl. 362-303.000.
Saito, Yasuhisa; Kanagawa, Shuichi; Watanabe, Katsuya; and Kamio, Kumimasa, to Sumitomo Chemical Company, Ltd. Thermosettable imide compound and epoxy resin composition containing the same. 4,985,529, Cl. 528-96.000.
Saito, Yoshihiro: *See*—
Wada, Nobuhide; Saito, Yoshihiro; Kusano, Shoji; Toyokawa, Yasuhumi; Miyazawa, Takeshige; Kajiwara, Ikuo; and Takahashi, Satoru, 4,985,066, Cl. 71-92.000.
Saito, Yuuji; and Ogoda, Makoto, to Fuji Photo Film Co., Ltd. Stacker for stimulable phosphor sheets. 4,984,780, Cl. 271-292.000.
Saitoh, Nobuhiro: *See*—
Kurita, Akitsugu; Takezawa, Yoshiaki; Saitoh, Nobuhiro; Shimada, Takehisa; and Takemoto, Hideaki, 4,985,286, Cl. 428-34.700.
Saitoh, Takeshi: *See*—
Kitamura, Kozo; Saitoh, Takeshi; Ueki, Mitsuo; and Kobori, Keiichi, 4,985,070, Cl. 75-238.000.
Sakabe, Yukio: *See*—
Mori, Yoshiaki; Fujino, Masaru; Takagi, Hiroshi; and Sakabe, Yukio, 4,985,381, Cl. 501-136.000.
Sakae Riken Kogyo Co., Ltd.: *See*—
Watanabe, Toshiharu, 4,985,194, Cl. 264-247.000.
Sakagami, Hiroshi; Konno, Kunio; and Nonoyama, Meihan. Anti-HIV agents. 4,985,249, Cl. 424-195.100.
Sakagami, Seiji: *See*—
Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, 4,985,623, Cl. 250-231.160.
Sakaguchi, Yoshihiro: *See*—
Kuwamoto, Hiroshi; Sakaguchi, Yoshihiro; Nagamori, Hiroyuki; and Nakagawa, Yasuhiro, 4,985,158, Cl. 252-49.300.
Sakai, Jun; and Ohta, Mitsuru, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus and method for recording image. 4,985,727, Cl. 355-27.000.
Sakai, Minoru; Katoh, Kazunobu; Yamaguchi, Jiro; Okada, Hisashi; Yasuda, Tomokazu; and Satake, Masaki, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,985,338, Cl. 430-264.000.
Sakai, Morio: *See*—
Kouno, Yoshiaki; and Sakai, Morio, 4,985,103, Cl. 156-184.000.
Sakai, Norio: *See*—
Kohno, Yoshiaki; and Sakai, Norio, 4,985,098, Cl. 156-89.000.
Sakakura, Shigeki; and Komuro, Akihiro, to Fujitsu Limited. Image-forming apparatus. 4,985,731, Cl. 355-210.000.
Sakamaki, Yoshitaka: *See*—
Sugawara, Hitoshi; Goto, Minoru; Sakamaki, Yoshitaka; and Fujita, Toshio, 4,985,208, Cl. 422-135.000.
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Yano, Toshihiko; Fujimoto, Izumi; and Takada, Yoji, to Sumitomo Chemical Company, Limited. Benzoylurea derivative and its production and use. 4,985,460, Cl. 514-594.000.
Sakamoto, Shuji, to Idemitsu Kosan Co., Ltd. Electrophotographic photoreceptor. 4,985,326, Cl. 430-96.000.
Sakamoto, Yoshihiro: *See*—
Isozaki, Hideo; Mizutani, Tomoji; and Sakamoto, Yoshihiro, 4,985,197, Cl. 264-564.000.
Sakano, Katsuichi: *See*—
Hayakawa, Isao; Atarashi, Shohgo; Imamura, Masazumi; Yokohama, Shuichi; Higashihashi, Nobuyuki; Sakano, Katsuichi; and Ohshima, Masayuki, 4,985,557, Cl. 540-598.000.
Sakano, Makoto: *See*—
Shigeta, Toshio; Kishi, Yoshio; Kohata, Toshihide; and Sakano, Makoto, 4,984,750, Cl. 242-58.100.
Sakao, Nobuo: *See*—
Kuraoka, Yasuo; and Sakao, Nobuo, 4,984,430, Cl. 62-51.100.
Sakashita, Kiichiro; Tanikawa, Hirohide; Yoshida, Satoshi; Nakahara, Toshiaki; Matsushige, Naoki; Fujiwara, Masatsugu; and Mitsuhashi, Yasuo, to Canon Kabushiki Kaisha. Non-magnetic toner. 4,985,327, Cl. 430-106.600.
Sakashita, Takeshi; Arata, Masami; and Yamamoto, Takashi, to Mitsui Petrochemical Industries, Ltd. Curable composition. 4,985,516, Cl. 526-196.000.
Sakatsuji, Takao: *See*—
Samejima, Kazuo; Kawakita, Hiroaki; Togoshi, Yoshikazu; Matsuda, Yoshiaki; Sakatsuji, Takao; and Fulford, Colin, 4,984,420, Cl. 56-203.000.
Saken Corporation: *See*—
Higa, Teruo, 4,985,060, Cl. 71-6.000.
Sako, Norimitsu: *See*—
Ishii, Toshikazu; and Sako, Norimitsu, 4,985,867, Cl. 365-221.000.
Sakuma, Ken, to Kenji Sakuma, Kenji. Process for producing fried food. 4,985,266, Cl. 426-438.000.

Sakuma, Nobumitsu: *See*—
Kageyama, Naoki; Kuchiwaki, Hiroji; Ito, Junki; Sakuma, Nobumitsu; and Ogura, Yukio, 4,984,567, Cl. 128-660.020.
Sala, Alberto: *See*—
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Napoletano, Mauro; and Sala, Alberto, 4,985,428, Cl. 514-252.000.
Sala, Guido; and Zucchiatti, Ivano, to Incas International Carbon Solvent S.p.A. Removable self-adhesive sheet with writable surface. 4,985,302, Cl. 428-343.000.
Salett, Ronald M.: *See*—
Webb, David A., Jr.; Fite, David B.; Hetherington, Ricky C.; McKeen, Francis X.; Firstenberg, Mark A.; Murray, John E.; Manley, Dwight P.; Salett, Ronald M.; and Fossum, Tryggve, 4,985,825, Cl. 364-200.000.
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Pernelle, Andre; and Desbiolles, Jack, 4,984,794, Cl. 273-80.100.
Rullier, Pierre, 4,984,816, Cl. 280-625.000.
Samejima, Kazuo; Kawakita, Hiroaki; Togoshi, Yoshikazu; Matsuda, Yoshiaki; Sakatsuji, Takao; and Fulford, Colin, to Kubota, Ltd. Dumping apparatus for grass catcher. 4,984,420, Cl. 56-203.000.
Sampa, Augdon; and Thomeer, Bart, to Dowell Schlumberger Incorporated. Hydraulic release joint for tubing systems. 4,984,632, Cl. 166-237.000.
Sampath, Barbara A.; Matysek, James F.; and Taylor, Thomas N., to Xerox Corporation. Control system for reproduction machines providing an extended almost jam interval and shutdown delay. 4,985,729, Cl. 355-206.000.
Sampei, Keiichi; and Kawasaki, Masami, to Kubota, Ltd. Apparatus for mounting grass box of mower. 4,984,419, Cl. 56-202.000.
Samsung Electronics Co., Ltd.: *See*—
Lee, Jung-Sup, 4,985,915, Cl. 379-165.000.
Sanden Corporation: *See*—
Oike, Katsumi, 4,984,710, Cl. 221-242.000.
Sekiguchi, Ryoichi, 4,984,511, Cl. 99-287.000.
Sanderson, Ronald D.; Dowler, Norman A.; and Van Reenen, Albert J., to Water Research Commission. Semipermeable membranes. 4,985,145, Cl. 210-321.750.
Sandre, Giovanni: *See*—
Neri, Carlo; Nodari, Nereo; and Sandre, Giovanni, 4,985,481, Cl. 524-120.000.
Sands, Robert E.; and Floren, Carl E., to Mueller Co. Method for forming a ball valve connection. 4,984,362, Cl. 29-890.128.
Sankyo Co., Ltd.: *See*—
Ataka, Kikuo; Imaoka, Koji; Yoshii, Kiyotaka; and Hirotsu, Kenji, 4,985,596, Cl. 564-258.000.
Takiguchi, Yo; Tani, Tokio; Kawashima, Ichiro; Ohsumi, Jun; Furukawa, Hidehiko; and Ohmine, Toshinori, 4,985,361, Cl. 435-218.000.
Sano, Shoichi; Furukawa, Yoshimi; Takei, Akihiko; Nishi, Yutaka; and Ohno, Yasuaki, to 501 Honda Giken Kogyo Kabushiki Kaisha. Steering system for motor vehicle. 4,984,646, Cl. 180-79.100.
Sano, Tetsuro: *See*—
Suzuki, Kenichi; Inada, Haruaki; Kiue, Akira; and Sano, Tetsuro, 4,985,558, Cl. 546-256.000.
Sansevero, Frank; and Nguyen, Dat, to Otis Elevator Company. Balustrade radius development for curved escalator. 4,984,671, Cl. 198-328.000.
Sansho Seiyaku Co., Ltd.: *See*—
Higa, Yoshitaka, 4,985,255, Cl. 424-583.000.
Motono, Masahiro, 4,985,455, Cl. 514-460.000.
Santa Barbara Research Center: *See*—
Ahlgren, William L., 4,985,281, Cl. 427-248.100.
Santandrea, Luciano; and Lombardi, Massimo, to Axis S.p.A. Production line for electric motor subassemblies. 4,984,353, Cl. 29-714.000.
Sante Fe International Corporation: *See*—.
Recalde, Carlos E., 4,984,934, Cl. 405-168.000.
Santel, Hans-Joachim: *See*—
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 4,985,063, Cl. 71-88.000.
Santi, Giunio G. Closed circuit system for recycling the exhaust gases of a combustion engine. 4,984,426, Cl. 60-281.000.
Sanwa Kagaku Kenkyusho Co., Ltd.: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Unno, Ryoichi; Matsumoto, Yukiharu; Kimura, Hiromoto; Oka, Mitsuru; and Sawai, Kiichi, 4,985,569, Cl. 548-453.000.
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Mohara, Masayuki; and Kano, Yoshinori, 4,984,354, Cl. 29-740.000.
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Sapre, Ajit V., to Mobil Oil Corporation. Reducing NO_x emissions from FCC regenerators by segregated cracking of feed. 4,985,133, Cl. 208-78.000.
Sarli, Michael S.: *See*—
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Sasa, Nobumasa; Shimizu, Kunio; Watanabe, Manabu; Urano, Toshiyuki; Mayama, Shinya; and Masuda, Tetsuya, to Konica Corporation; and Mitsubishi Kasei Corporation. Image forming method and element, in which the element contains a release layer and a photosensitive o-quinone diaziode layer. 4,985,337, Cl. 430-254.000.
Sasaki, Ichirou: *See*—
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Sasaki, Naoki; and Kawaguchi, Katuhide, to Yokohama Rubber Co., Ltd., The. Process for building pneumatic radial tires wherein two building drums rotate between two building positions. 4,985,100, Cl. 156-110.100.
Sashida, Nobuo: *See*—
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Sashihara, Kenji: *See*—
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Sato, Akira: *See*—
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Sato, Hideo: *See*—
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Sato, Koichi, to Kabushiki Kaisha Toshiba. Apparatus for detecting a pixel correlation and generating an interpolation signal for a digital television signal. 4,985,764, Cl. 358-105.000.
Sato, Norio: *See*—
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Sato, Shigeji: *See*—
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Sato, Takeaki; Kozaki, Yoshihiro; and Hirota, Kunio, to Brother Kogyo Kabushiki Kaisha. Plastic working method and apparatus. 4,984,443, Cl. 72-67.000.
Sato, Tsunehiko: *See*—
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Sato, Yoshio: *See*—
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Satoh, Shuichi; Tsuji, Kazuwo; Nakashima, Takeru; Yazu, Shuji; Nisida, Yosio; Muro, Kiyofumi; Demizu, Yuzo; Nakagawa, Masuo; and Okada, Moritami, to Sumitomo Electric Industries, Ltd. Hole-burning material and production thereof. 4,985,226, Cl. 423-446.000.
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Satoh, Yoshiyuki: *See*—
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Sattler, Kenneth G. Machine for forming woodworking tool. 4,984,391, Cl. 51-100.00R.

Sauder, Robert A., to Thermal Ceramics, Inc. Insulation and the provision thereof. 4,984,405, Cl. 52-506.000.

Sauer, Gerd, to Saint Gobain Vitrage. Power supply circuit for a motor vehicle with two load voltages. 4,985,671, Cl. 323-282.000.

Sauerbrey, David W.: *See*—
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Saunders, Brian, to Cooper Industries, Inc. Collet type connector. 4,984,830, Cl. 285-368.000.

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Sawada, Michinori; Watanabe, Norio; and Endo, Yoshiaki, to Tsukishima Kikai Co., Ltd. Jig for fixing bearing. 4,984,345, Cl. 29-263.000.

Sawada, Yasushi: *See*—
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Sawai, Eisuke: *See*—
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Sawai, Kiichi; Takeda, Jun; Seino, Yutaka; Imura, Hiroo; Tanaka, Kenichi; Takahashi, Haruo; Mitani, Takahiko; and Kurono, Masayasu, to Sanwa Kagaku Kenkyusho Co., Ltd. Cloning of DNA encoding human motilin precursor and expression of the precursor. 4,985,356, Cl. 435-69.400.

Sawai, Kiichi: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Unno, Ryoichi; Matsumoto, Yukiharu; Kimura, Hiromoto; Oka, Mitsuru; and Sawai, Kiichi, 4,985,569, Cl. 548-453.000.
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Sawai, Nobumitsu: *See*—
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Sawamura, Norio; Matsuo, Takaharu; and Hashimoto, Yukio, to Fuji Oil Company, Ltd. Method for processing glyceride fats and oils. 4,985,358, Cl. 435-134.000.

Sawaoka, Akira; Matsuda, Ryuichi; and Kondo, Tadashi, to Aisin Seiki Kabushiki Kaisha. Method for producing a superconductor of an immiscible alloy and its oxide. 4,985,401, Cl. 505-1.000.

Saxer, Christian: *See*—
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Scaglia, Patrick: *See*—
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Scalisi, Joseph F.: *See*—
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Scalisi, Phillip M.; and Scalisi, Joseph F. Collapsible disposable chair. 4,984,848, Cl. 297-440.000.

Scalzitti, Attilio; and Snyder, Clarence A. Apparatus for removing fluid from overlapping sheets of material. 4,984,516, Cl. 100-90.000.

Scandinavian Bellyloading Company Aktiebolag: *See*—
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Schaffert, Wolfgang: *See*—
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Schaller, Helmut F. K. Adjustable counter-tensioning mechanism for stringed instrument tremolo device. 4,984,493, Cl. 84-313.000.

Schaller, Klaus: *See*—
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Schille, Ron. Electronic harmonica for controlling sound synthesizers. 4,984,499, Cl. 84-734.000.

Schippl, Klaus, to Kabelmetal Electro. Conducting tube. 4,984,605, Cl. 138-149.000.

Schlagbohmer, Hermann: *See*—
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Schlepfer, Walter: *See*—
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Schmid, Peter J. Method for removing nitrogen oxides from gases. 4,985,217, Cl. 423-235.000.

Schmidt, Charles J.; Kadin, Joseph; and Poteat, S. Eugene, to Broad-Com, Inc. Retrodirective adaptive loop for meteor communications. 4,985,707, Cl. 342-370.000.

Schmidt, Dieter; and Schuseil, Bolko, to INA Walzlager Schaeffler KG. Tensioning device for chain or belt drives. 4,985,009, Cl. 474-110.000.

Schmidt, Elmar: *See*—
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Schneider, Gottlieb R. All condition fishing waders. 4,984,377, Cl. 36-134.000.

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Scholz, Ralph-Peter; and Glockner, Volker, to VEB Kombinat Medizinund Labortechnik Leipzig. Process for hydrophobization of microbacteria retaining air filter. 4,985,280, Cl. 427-244.000.

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Schraag, Martin: *See*—
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Schrors, Gunter. Hydrostatically supported roll and a sealing element therefor. 4,984,343, Cl. 29-116.200.

Schubart, Rudiger; Pieroth, Manfred; and Kempermann, Theo, to Bayer Aktiengesellschaft. Process for the preparation of rubber/-metal composite materials with a powerful rubber/metal bond. 4,985,305, Cl. 428-389.000.

Schueler, Ralf; Muegge, Joachim; Droescher, Michael; Bartz, Wilfried; and Feinauer, Roland, to Huels Aktiengesellschaft. Thermoplastic molding compositions, and a process for the production thereof. 4,985,494, Cl. 525-67.000.

Schuett, Dieter; and Glaeser, Winfried, to Siemens Aktiengesellschaft. Connection network for the adjustable connection of a PLA. 4,985,649, Cl. 307-465.000.

Schuett, Dieter; and Glaeser, Winfried, to Siemens Aktiengesellschaft. Programmable logic circuit having bidirectional data lines. 4,985,650, Cl. 307-465.000.

Schuhmacher, Manfred: *See*—
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Schukat, Manfred, to Messerschmitt-Boelkow-Blohm GmbH. Process for data transmission by means of a geo-stationary satellite and at least one sub-satellite. 4,985,706, Cl. 342-352.000.

Schulenberg, Andreas; and Schraag, Martin, to Hewlett-Packard Company. Circuitry for heartbeat. 4,984,576, Cl. 128-661.070.

Schultz, Gary V.: *See*—
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Schwalbe, Kurt E.: *See*—
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Schwartz, Hermann, to SPA Syspatronic AG. Portable data carrying device. 4,985,921, Cl. 380-24.000.

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SCI Systems, Inc.: *See—*
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Scott, Fraser; and Budden, Raymond G., to Ring Sights Worldwide Limited. Gun sight. 4,984,370, Cl. 33-241.000.

Scott, Ralph F., Jr.; and Locotos, Frank M., to H&S Machine & Supply Company, Inc.; and F.M.Locotos Co., Inc. Coated washer for an anchor bolt system. 4,984,938, Cl. 405-261.000.

Seagate Technology, Inc.: *See—*
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Sears, Kim W.: *See—*
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Secrist, John A., III; Montgomery, John A.; Ealick, Steve E.; Erion, Mark D.; and Guida, Wayne C., to BioCryst, Inc. 2-amino-7-(pyridinylmethyl)-3H,5H-pyrrolo[3,2-d]pyrimidin-4-ones and pharmaceutical uses and compositions containing the same. 4,985,433, Cl. 514-258.000.

Secrist, John A., III; Montgomery, John A.; Ealick, Steve E.; Erion, Mark D.; and Guida, Wayne C., to Biocryst, Inc. 7-substituted derivatives of 2-amino-3H,5H-pyrrolo(3,2-d)pyrimidin-4-ones and pharamceutical uses and compositions containing the same. 4,985,434, Cl. 514-248.000.

Seguin, Marie-Christine: *See—*
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Seidel, Andreas: *See—*
Erpenbach, Heinz; Lork, Winfried; Seidel, Andreas; and Prinz, Peter, 4,985,383, Cl. 502-24.000.

Seifert, Heinz: *See—*
Kurr, Klaus; Eckel, Hans-Gerd; Seifert, Heinz; Idigkeit, Werner; and Barth, Armin, 4,984,777, Cl. 267-140.100.

Seifert, William W., to Institute Guilfoyle. Firearm wear analysis. 4,984,381, Cl. 42-1.010.

Seike, Shoji; Mima, Toshiyuki; and Mori, Koichi, to NGK Insulators, Ltd. Optical fiber-containing insulators and producing process thereof. 4,984,860, Cl. 350-96.100.

Seiko Epson Corporation: *See—*
Asahina, Michio, 4,985,746, Cl. 357-67.000.

Seiko Instruments Inc.: *See—*
Namisato, Tooru, 4,985,877, Cl. 368-76.000.
Take, Masafumi; Takeda, Haruo; and Nakamura, Nobutaka, 4,984,469, Cl. 73-770.000.

Seikosha Co., Ltd.: *See—*
Akimoto, Kazuo; Hirai, Toshiaki; and Tanikawa, Miyoshi, 4,985,724, Cl. 354-400.000.

Seino, Toshio; and Tatsumi, Norio, to Dairei Co. Ltd. Brine refrigerating apparatus. 4,984,435, Cl. 62-434.000.

Seino, Yutaka: *See—*
Sawai, Kiichi; Takeda, Jun; Seino, Yutaka; Imura, Hiroo; Tanaka, Kenichi; Takahashi, Haruo; Mitani, Takahiko; and Kurono, Masayasu, 4,985,356, Cl. 435-69.400.

Seitetsu Kagaku Co., Ltd.: *See—*
Haruna, Kazuo; Ueda, Kanji; Inoue, Masahiro; and Someda, Hitosi, 4,985,052, Cl. 55-26.000.

Seki, Junji, to Fujitsu Limited. Integrated circuit card. 4,985,920, Cl. 380-23.000.

Seki, Yasuyuki: *See—*
Ohta, Tomohisa; Hagiwara, Hiroyuki; Kanbara, Hisashige; Dobashi, Akihiko; and Seki, Yasuyuki, 4,985,471, Cl. 522-27.000.

Sekigawa, Toshio; and Yoshihara, Kenichi, to Shin-Etsu Handotai Company Limited. Chamfering the notch of a semiconductor wafer. 4,984,392, Cl. 51-165.770.

Sekiguchi, Ryoichi, to Sanden Corporation. Beverage brewing apparatus for vending machines. 4,984,511, Cl. 99-287.000.

Sekiguchi, Takeshi; Shiga, Nobuo; and Aga, Keigo, to Sumitomo Electric Industries, Ltd. Optical semiconductor device. 4,985,597, Cl. 174-52.400.

Sekiguchi, Yoshinori: *See—*
Takano, Seiichi; Shimazaki, Yohichi; Sekiguchi, Yoshinori; and Ogasawara, Kunio, 4,985,571, Cl. 549-283.000.

Sekine, Kazumi; and Suwa, Kaname, to Canon Kabushiki Kaisha. Recording apparatus having a platen rotatable between positions in which the platen faces and is separated from a recording head. 4,984,916, Cl. 400-613.100.

Sekine, Kunio; Araki, Daisuke; and Suzuki, Yoshiki, to Teljin Limited. Intranasally applicable powdery pharmaceutical composition. 4,985,242, Cl. 424-85.400.

Sekine, Takayuki; and Takekawa, Naomitsu, to Tokyo Eizai Laboratory Co., Ltd. Orthopedic casting tape. 4,984,566, Cl. 128-90.000.

Sekino, Naomi: *See—*
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 4,984,575, Cl. 128-660.030.

Seko, Yasutoshi; and Saito, Tomoko, to Nissan Motor Company, Ltd. Vehicle headlamp. 4,985,816, Cl. 362-303.000.

Sendelweck, Gene K., to RCA Licensing Corporation. Black level tracking for multiple frequency apparatus. 4,985,665, Cl. 315-386.000.

Sensor Electronics, Inc.: *See—*
Langberg, Edwin; and Caruso, F. Gerald, 4,985,925, Cl. 381-72.000.

Seo, Iwao; Nakajima, Kenji; and Kishimoto, Manabu, to Mitsubishi Petrochemical Co., Ltd. Optical material. 4,985,179, Cl. 252-587.000.

Serikawa, Yoshio, to Ricoh Company, Ltd. Auto-flash photographing system. 4,985,725, Cl. 354-416.000.

Service Ideas, Inc.: *See—*
King, Frederick M.; and Collins, Harry F., 4,984,690, Cl. 206-503.000.

Servy, Claudine G.: *See—*
Wimmer, Eric P.; Lecolier, Serge L.; Ducrocq, Claire A.; Servy, Claudine G.; and Lenfant, Maryse T., 4,985,357, Cl. 435-128.000.

Severino, Dino: *See—*
Cozzi, Paolo; Carganico, Germano; Severino, Dino; Lovisolo, Pierpaolo; and Chiari, Augusto, 4,985,440, Cl. 514-397.000.

Seyama, Fumio; Tsuchida, Tetsuo; and Kondo, Mitsuru, to Kanzaki Paper Manufacturing Co., Ltd. Heat sensitive recording material. 4,985,393, Cl. 503-216.000.

S gaard, Dennis, to A/S Phonix Contractors. Method for decontaminating a material and an assembly for carrying out said method. 4,985,083, Cl. 134-26.000.

SGI Inc.: *See—*
Jacober, Jeffrey M., 4,984,662, Cl. 190-107.000.

Shalom, Stephen R.; and Cane, David A., to Shalom, Stephen R. Multiple message answering machine keyed to the incoming phone number. 4,985,913, Cl. 379-76.000.

Shandon Scientific Limited: *See—*
Bowman, David J.; Cosgrove, Raymond F.; Male, Terence P.; and Evans, Robert, 4,985,206, Cl. 422-99.000.

Shannon, E. Paul. Rate of turn indicator. 4,984,459, Cl. 73-178.00R.

Shar, Malvin L.: *See—*
Feldman, Nathan W.; and Shar, Malvin L., 4,985,800, Cl. 361-113.000.

Sharon Manufacturing Company: *See—*
Hudson, Sharon J., Jr., 4,984,548, Cl. 123-470.000.

Sharp Kabushiki Kaisha: *See—*
Honda, Iwakazu; and Yui, Yuhi, 4,985,734, Cl. 355-298.000.
Matsumoto, Satoshi; Azuma, Daisuke; and Miyata, Souichi, 4,985,890, Cl. 370-94.100.
Nagashima, Nobuyoshi; Matsumoto, Toshio; Yasuda, Shuhei; Kawaguchi, Takafumi; and Takeda, Makoto, 4,985,770, Cl. 358-152.000.
Nakatani, Hiroshi, 4,985,663, Cl. 315-169.300.
Ohashi, Kunio, 4,985,728, Cl. 355-77.000.
Ohta, Kenji; Takahashi, Akira; Katayama, Hiroyuki; Hirokane, Junji; and Murakami, Yoshiteru, 4,985,885, Cl. 369-275.100.
Oya, Yuichiro, 4,985,607, Cl. 219-10.55E.
Tanaka, Shigeki; and Satoo, Hiroki, 4,985,918, Cl. 379-356.000.
Yoshida, Yoshio; Ogata, Nobuo; Ishii, Mitsuo; Kurata, Yukio; Nakata, Yasuo; Inoue, Takayuki; and Inoue, Kazuko, 4,985,880, Cl. 369-13.000.

Shekleton, Jack R., to Sundstrand Corporation. Fuel injection system for a turbine engine. 4,984,424, Cl. 60-39.940.

Shell Oil Company: *See—*
George, Eric R., 4,985,278, Cl. 427-195.000.
Madgavkar, Ajay M., 4,985,139, Cl. 208-321.000.
Vinegar, Harold J.; and Stegemeier, George L., 4,984,594, Cl. 134-21.000.

Shenai, Krishna; Baliga, Bantval J.; Piacente, Patricia A.; and Korman, Charles S., to General Electric Company. Power field effect devices having low gate sheet resistance and low ohmic contact resistance. 4,985,740, Cl. 357-23.400.

Shepler, Peter R.; Gammon, Nathan A.; Hopkins, William M.; Koerner, James E.; and Schmaltz, Charles K., to Goodyear Tire & Rubber Company, The. Front and rear tire tread patterns in a four-wheeled tire/vehicle system. 4,984,616, Cl. 152-209.00A.

Sheppard, Clyde H.: *See—*
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,985,568, Cl. 548-431.000.

Sherrington, David C.: *See—*
Elmes, Alfred R.; Hammond, Kevin; and Sherrington, David C., 4,985,468, Cl. 521-63.000.

Shibahata, Yasuji, to Honda Giken Kogyo Kabushiki Kaisha. Drive power transmission mechanism for motor vehicles. 4,984,482, Cl. 74-650.000.

Shibata, Norio; and Tsunehiko, Sato, to Fuji Photo Film Co., Ltd. Coating method. 4,985,284, Cl. 427-428.000.

Shibata, Norio: *See—*
Takahashi, Shinsuke; Shibata, Norio; and Sato, Tsunehiko, 4,984,533, Cl. 118-419.000.

Shibata, Shinzi: *See—*
Kaede, Hiroshi; Koike, Tadahiro; Kato, Shinji; Maeda, Yorishige; Fuwa, Yoshio; Sugimoto, Shigetoshi; Aoyagi, Hikaru; and Shibata, Shinzi, 4,985,092, Cl. 148-326.000.

Shibata, Yoshihiko; Chikamori, Yoshihiro; and Shimizu, Youichi, to W. L. Gore & Associates, Inc. Foam-bursting device. 4,985,054, Cl. 55-178.000.

Shibuya Kogyo Co., Ltd.: *See*—
Hamano, Itirou, 4,984,680, Cl. 198-803.900.

Shibuya, Shohei: *See*—
Saito, Naohide; Shibuya, Shohei; and Inomata, Kentaro, 4,985,140, Cl. 208-347.000.

Shibuya, Yukio: *See*—
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,984,859, Cl. 350-96.240.

Shiga, Nobuo: *See*—
Sekiguchi, Takeshi; Shiga, Nobuo; and Aga, Keigo, 4,985,597, Cl. 174-52.400.

Shigemura, Tatsuya: *See*—
Kano, Kiyoshi; Kaku, Nobuyuki; Shigemura, Tatsuya; Tanaka, Yoshiyuki; Fukagawa, Yoshihiro; and Uesugi, Masaki, 4,985,788, Cl. 360-85.000.

Shigeta, Toshio; Kishi, Yoshio; Kohata, Toshihide; and Sakano, Makoto, to Tokyo Automatic Machinery Works Ltd. Method and apparatus for replacing web-like material in a web-like material supplying device. 4,984,750, Cl. 242-58.100.

Shih, Jenn S.; and Smith, Terry E., to GAF Chemicals Corporation. Zwitterion polymers. 4,985,487, Cl. 524-548.000.

Shih, Jenn S.: *See*—
Login, Robert B.; Merianos, John J.; Dandreaux, Gary; and Shih, Jenn S., 4,985,521, Cl. 526-264.000.

Shiinoki, Kazuaki: *See*—
Naya, Koutarou; Shiinoki, Kazuaki; Hayakawa, Tadashi; Masujima, Kiyoshi; Uchida, Riichi; and Matsubara, Katsumi, 4,984,974, Cl. 418-87.000.

Shikoku Chemicals Corporation: *See*—
Hata, Hajime; and Kanbara, Hajime, 4,985,222, Cl. 423-279.000.

Shillington, Richard A., to Med-Safe Systems, Inc.; and Becton, Dickinson and Company. Sharps container closure and needle extractor assembly. 4,984,686, Cl. 206-366.000.

Shima, Shozo: *See*—
Nakano, Masao; Mori, Keiichi; Hiraiwa, Yoshitaka; Iizuka, Shoji; Shima, Shozo; and Nakamura, Yukio, 4,984,904, Cl. 374-139.000.

Shimada, Hisanori: *See*—
Hayakawa, Kunio; Furuya, Hiromi; Shimada, Hisanori; Nakata, Masahiro; Kodera, Kaoru; Oohara, Kouji; and Akagi, Nobuo, 4,985,345, Cl. 430-335.000.

Shimada, Makoto: *See*—
Togai, Kazuhide; and Shimada, Makoto, 4,985,837, Cl. 364-426.020.

Shimada, Masaru: *See*—
Uemura, Hiroyuki; Suzuki, Akira; Shimada, Masaru; Mochizuki, Hidehiro; and Morohoshi, Naoya, 4,985,397, Cl. 503-227.000.

Shimada, Takehisa: *See*—
Kurita, Akitsugu; Takezawa, Yoshiaki; Saitoh, Nobuhiro; Shimada, Takehisa; and Takemoto, Hideaki, 4,985,286, Cl. 428-34.700.

Shimamura, Seiichi: *See*—
Okonogi, Shigeo; Tomita, Mamoru; Shimamura, Seiichi; Tomimura, Toshio; Ishibashi, Norio; Miyakawa, Hiroshi; and Sugawara, Koichi, 4,985,246, Cl. 424-115.000.

Shimazaki, Yohichi: *See*—
Takano, Seiichi; Shimazaki, Yohichi; Sekiguchi, Yoshinori; and Ogasawara, Kunio, 4,985,571, Cl. 549-283.000.

Shimizu, Hideto: *See*—
Horie, Shinji; Shimizu, Hideto; Ohmori, Michio; and Yui, Hiroshi, 4,984,326, Cl. 15-256.500.

Shimizu, Hisashi: *See*—
Shiobara, Toshio; Tsuchiya, Takashi; and Shimizu, Hisashi, 4,985,751, Cl. 357-72.000.

Shimizu, Kanzi: *See*—
Himeno, Kiyoshi; Hihara, Toshio; Shimizu, Kanzi; and Shimizu, Yukiharu, 4,985,545, Cl. 534-618.000.

Shimizu, Keisuke; Matsumura, Takumi; and Nakamoto, Masato, to Mikasa Seiyaku Co., Ltd.; and Daito Koeki Kabushiki Kaisha. 2-anilinophenylacetic acid derivative. 4,985,456, Cl. 514-467.000.

Shimizu, Kenzo; and Ogata, Shizuo, to Nissan Motor Company, Limited. Adjustable vehicle seat for use with a passive seat belt. 4,984,822, Cl. 280-804.000.

Shimizu, Koji; and Hamada, Mitsuo, to Toray Silicone Company Ltd. Method of making tack-free silicone gel moldings. 4,985,277, Cl. 427-180.000.

Shimizu, Kunio: *See*—
Sasa, Nobumasa; Shimizu, Kunio; Watanabe, Manabu; Urano, Toshiyuki; Mayama, Shinya; and Masuda, Tetsuya, 4,985,337, Cl. 430-254.000.

Shimizu, Naohiko; and Sawamoto, Hideo, to Hitachi, Ltd. Method and apparatus for generating a real address multiple virtual address spaces of a storage. 4,985,828, Cl. 364-200.000.

Shimizu, Youichi: *See*—
Shibata, Yoshihiko; Chikamori, Yoshihiro; and Shimizu, Youichi, 4,985,054, Cl. 55-178.000.

Shimizu, Yukiharu: *See*—
Himeno, Kiyoshi; Hihara, Toshio; Shimizu, Kanzi; and Shimizu, Yukiharu, 4,985,545, Cl. 534-618.000.

Shimoda, Kenji; and Oosawa, Shin-ichi, to Kabushiki Kaisha Toshiba. Area specifying signal generation device using output video signal from video camera. 4,985,755, Cl. 358-22.000.

Shimomura, Setsuhiro; Wataya, Seiji; Nishimura, Yukinobu; and Okubo, Satoru, to Mitsubishi Denki Kabushiki Kaisha. Engine control apparatus. 4,984,546, Cl. 123-425.000.

Shimomura, Tadao: *See*—
Kimura, Kazumasa; Hatsuda, Takumi; Irie, Yoshio; and Shimomura, Tadao, 4,985,514, Cl. 526-88.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Amano, Tadashi; and Hoshida, Shigehiro, 4,985,524, Cl. 526-344.200.
Kishita, Hirofumi; Yamaguchi, Kouichi; and Takago, Toshio, 4,985,526, Cl. 528-15.000.
Shinohara, Toshio; and Inoue, Yoshifumi, 4,985,577, Cl. 556-445.000.
Shiobara, Toshio; Tsuchiya, Takashi; and Shimizu, Hisashi, 4,985,751, Cl. 357-72.000.

Shin-Etsu Handotai Company Limited: *See*—
Sekigawa, Toshio; and Yoshihara, Kenichi, 4,984,392, Cl. 51-165.770.

Shinagawa Refractories Co., Ltd.: *See*—
Ichikawa, Kenji; Tsukamoto, Noboru; Iida, Eishi; Yoshimura, Yuji; and Inoue, Junichi, 4,985,378, Cl. 501-89.000.

Shindou, Yoshio; and Yamazaki, Fumio, to Nippon Steel Corporation. Zn-Ni based composite electroplated steel sheet and multi-layer composite plated steel sheet. 4,985,311, Cl. 428-623.000.

Shinjo, Goro: *See*—
Kohama, Takuji; Minagawa, Fumiyasu; Shinjo, Goro; and Maeda, Kazuyuki, 4,985,413, Cl. 514-79.000.

Shinko Electric Industries Co., Ltd.: *See*—
Masuda, Norihiro, 4,985,105, Cl. 156-261.000.

Shinmura, Satoru: *See*—
Nishikawa, Toshio; Tanaka, Hiroaki; and Shinmura, Satoru, 4,985,709, Cl. 343-787.000.

Shinoda, Akihisa; Fujita, Motohiro; Tsusaka, Haruo; Yonezawa, Makoto; and Nakano, hiroyuki, to Honda Giken Kogyo Kabushiki Kaisha. Liquid cooled internal combustion engine. 4,984,539, Cl. 123-41.420.

Shinohara, Toshio; and Inoue, Yoshifumi, to Shin-Etsu Chemical Co., Ltd. 3-(3,4-dimethoxyphenyl)propyltrichlorosilane. 4,985,577, Cl. 556-445.000.

Shinozaki, Fumiaki: *See*—
Saeki, Keiso; Shinozaki, Fumiaki; and Fujita, Yutaka, 4,985,331, Cl. 430-138.000.

Shinozaki, Satoru, to Fanuc Ltd. Arbitrarily shaped workpiece machining method. 4,985,840, Cl. 364-474.290.

Shiobara, Toshio; Tsuchiya, Takashi; and Shimizu, Hisashi, to Shin-Etsu Chemical Co., Ltd. Resin-encapsulated semiconductor devices. 4,985,751, Cl. 357-72.000.

Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, to Fujisawa Pharmaceutical Co., Ltd. Pyrazolopyridine compound and processes for preparation thereof. 4,985,444, Cl. 514-300.000.

Shioya, Makoto; and Adachi, Masao, to Hitachi, Ltd. Visual sensor system. 4,985,847, Cl. 364-516.000.

Shiratori Co. Ltd.: *See*—
Fujimaki, Yoko, 4,984,783, Cl. 272-565.00R.

Shirodkar, Pradeep P., to Mobil Oil Corporation. Process of forming films from blends of linear low density ethylene copolymers. 4,985,498, Cl. 525-86.000.

Shirotori, Yozo, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Bearing device. 4,984,909, Cl. 384-493.000.

Shiryon, Baruch. Board game. 4,984,807, Cl. 273-262.000.

Shiseido Company Ltd.: *See*—
Chiba, Tadahiro; Miyazawa, Kiyoshi; Uzuka, Makoto; and Suzuki, Takashi, 4,985,425, Cl. 514-222.200.

Shoger, Kirk D.: *See*—
Tegeler, John J.; and Shoger, Kirk D., 4,985,450, Cl. 514-361.000.

Shop-Vac Corporation: *See*—
Berfield, Robert C., 4,984,328, Cl. 15-322.000.
Berfield, Robert C.; and Meland, Ronald F., 4,984,330, Cl. 15-415.10R.

Showa Denko K.K.: *See*—
Izumi, Zenichiro; Kurosawa, Shigeru; and Akiyoshi, Rika, 4,985,502, Cl. 525-194.000.

Shrivastava, Anil B.: *See*—
Bajpai, Atul; Marczewski, Richard W.; Marek, Melissa M.; Shrivastava, Anil B.; Amble, Charles S.; Joyce, Robert H.; Kishore, Nanda; and Ollanik, Steven J., 4,985,857, Cl. 364-551.010.

Shurtleff, Jill M.: *See*—
Leonard, Elizabeth C.; and Shurtleff, Jill M., 4,984,365, Cl. 30-34.050.

Sibuya, Hitosi: *See*—
Utunomiya, Jiro; Iida, Saburo; Sibuya, Hitosi; Kusaba, Kazunori; and Narumi, Isao, 4,985,747, Cl. 357-68.000.

Siegel, Carole E.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,985,459, Cl. 514-561.000.

Siemens Aktiengeselischaft: *See*—
Auer, Heinz; and Winkler, Gernot, 4,984,342, Cl. 29-25.030.
Bjoerk, Erik; and Wiklund, Ola, 4,985,909, Cl. 378-173.000.
Brunner, Matthias; Frosien, Juergen; Schmitt, Reinhold; and Lischke, Burkhard, 4,985,681, Cl. 324-501.000.
Heerman, Marcel, 4,985,600, Cl. 174-255.000.
Mayr, Ernst; and Oestreich, Ulrich, 4,985,185, Cl. 264-1.500.
Niederreiter, Hans, 4,985,818, Cl. 363-19.000.
Obermann, Peter; and Franetzki, Manfred, 4,985,015, Cl. 604-67.000.
Rattner, Manfred; and Plisek, Franz, 4,984,565, Cl. 128-24.0EL.
Rauner, Hans; Grauvogl, Erwin; Gerl, Gerhard; and Forster, Josef, 4,985,859, Cl. 364-565.000.
Riedel, Wolfgang; Wissler, Richard; Fichter, Otmar; Gregorius, Klaus; Mattauch, Gerhard; and Schorner, Heinz, 4,985,805, Cl. 361-386.000.

Schuett, Dieter; and Glaeser, Winfried, 4,985,649, Cl. 307-465.000.
Schuett, Dieter; and Glaeser, Winfried, 4,985,650, Cl. 307-465.000.
Silberstein, Beniamino. Composing plane for two-sided puzzles. 4,984,798, Cl. 273-157.00R.
Silverman, Stanley; Konechy, Kenneth A.; Van De Walker, Ray G.; and Newman, Richard S., to Printronix, Inc. Printer having ribbon wear indicator. 4,984,913, Cl. 400-249.000.
Simandoux, Jean-Claude: *See—*
Renard, Pierre; Simandoux, Jean-Claude; and Burzynski, Jean-Pierre, 4,985,209, Cl. 422-140.000.
Simkins, Barry: *See—*
Lytra, Eric; Loeber, Peter J.; and Simkins, Barry, 4,985,613, Cl. 235-101.000.
Simmonds Precision Products, Inc.: *See—*
Spillman, William B., Jr., 4,985,624, Cl. 250-237.00G.
Simmons, Richmond R. Disposable refrigerated safety razor head. 4,984,364, Cl. 30-32.000.
Simmons, Walter J.: *See—*
Rucker, Klaus G.; Simmons, Walter J.; and Stilwell, Larry T., 4,985,610, Cl. 219-70.000.
Simmons, William W.: *See—*
Botez, Dan; Jansen, Michael; Mawst, Luke J.; Peterson, Gary L.; Simmons, William W.; Wilcox, Jaroslava Z.; and Yang, Jane J. J., 4,985,897, Cl. 372-50.000.
Simpson, Stuart M.; Garth, Peter; and Richards, Jonathan. Bed warmer. 4,984,316, Cl. 5-508.000.
Singer, Norman; Wilcox, Reed; Podolski, Joseph S.; Chang, Hsien-Hsin; Pookote, Suseelan; Dunn, John M.; and Hatchwell, Leora, to Nutrasweet Company, The. Cream substitute ingredient and food products. 4,985,270, Cl. 426-515.000.
Sinha, Ashok K.: *See—*
Levinstein, Hyman J.; Powell, William D., Jr.; and Sinha, Ashok K., 4,985,373, Cl. 437-195.000.
Siol, Werner, to Rohm GmbH Chemische Fabrik. Compatible polymer blends. 4,985,504, Cl. 525-204.000.
Sionnet, Jean: *See—*
Renard, Paul; and Sionnet, Jean, 4,984,642, Cl. 175-329.000.
Sipinen, Alan J., to Minnesota Mining and Manufacturing Company. Disposable diaper having fastening means that are degradable. 4,985,024, Cl. 604-389.000.
Sipos, Peter A.: *See—*
Chatsick, James J.; and Sipos, Peter A., 4,985,102, Cl. 156-163.000.
SIPRA Patententwicklungs-und Beteiligungsgesellschfat mbH: *See—*
Nurk, Siegfried, 4,984,436, Cl. 66-144.000.
Sirti S.p.A.: *See—*
Giovanna, Marco D., 4,984,867, Cl. 350-96.210.
Sisken, Richard B.: *See—*
Fearnot, Neal E.; Hawkins, Melvin K.; and Sisken, Richard B., 4,985,022, Cl. 604-282.000.
Sizova, Svetlana I.: *See—*
Kozachevsky, Gennady G.; Boikov, Vladimir P.; Guskov, Valery V.; Molodan, Oleg I.; Sizova, Svetlana I.; and Gorodnichev, Jury N., 4,984,976, Cl. 425-35.000.
Skibinski, Robert E., to Mid-America Scale, Inc. Overhead lever torque suspension weighing scale. 4,984,644, Cl. 177-132.000.
Slattery, James J.: *See—*
Muth, James C.; and Slattery, James J., 4,984,737, Cl. 238-281.000.
Sledge, Larry C., to Specialty Packaging Licensing Company. Spouted bottle. 4,984,714, Cl. 222-109.000.
Slobodnik, Mark W.: *See—*
Caldwell, Joseph W.; and Slobodnik, Mark W., 4,984,449, Cl. 73-49.200.
Smejda, Richard K. Discontinuous, expandable modular processing for fibrous materials and sheetings in plastic, paper and metals. 4,984,439, Cl. 68-5.00C.
Smirnov, Igor G.: *See—*
Azamatov, Ramil A.; Zamitter, Mikhail N.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; and Smirnov, Igor G., 4,984,817, Cl. 280-680.000.
Smith, Andrew M., to Scicon Limited. Processing parameter generator for synthetic aperture radar. 4,985,704, Cl. 342-25.000.
Smith, Graham T., to Horisonscan Inc. Panoramic interactive system. 4,985,762, Cl. 358-87.000.
Smith, Jack E., to General Motors Corporation. End attachment assembly for a twisted rope torsion bar. 4,984,776, Cl. 267-276.000.
Smith, Jerry W.: *See—*
Wannlund, Jon C.; and Smith, Jerry W., 4,985,631, Cl. 250-361.00R.
Smith, Jesse W., to United Technologies Corporation. Acceleration control for a gas turbine engine. 4,984,425, Cl. 60-39.161.
Smith, Lowell S.: *See—*
Piel, Joseph E., Jr.; and Smith, Lowell S., 4,984,465, Cl. 73-602.000.
Smith, Michael F., to Cambridge Autotransfusion Service. Catheter grip. 4,985,018, Cl. 604-161.000.
Smith, Nicholas J. G.: *See—*
Penneck, Richard J.; O'Brien, James M.; Duckworth, Stephen J.; and Smith, Nicholas J. G., 4,985,313, Cl. 428-627.000.
Smith, Robert C. B., to Tri-Tech Inc. Motor feedback system. 4,985,669, Cl. 318-685.000.
Smith, Schuyler B.: *See—*
Clark, Joseph N.; and Smith, Schuyler B., 4,985,525, Cl. 528-15.000.
Smith, Terry E.: *See—*
Shih, Jenn S.; and Smith, Terry E., 4,985,487, Cl. 524-548.000.
Smith, Timothy S.: *See—*
Springer, Jack F., Jr.; Smith, Timothy S.; Cloutier, Cathy A.; Marcantonio, Ben A.; and Willis, Richard A., 4,984,571, Cl. 128-371.000.
SMR Technologies, Inc.: *See—*
Parish, James M., 4,984,522, Cl. 105-15.000.
Snyder, Clarence A.: *See—*
Scalzitti, Attilio; and Snyder, Clarence A., 4,984,516, Cl. 100-90.000.
Snyder, Fred E.: *See—*
Basile, Peter A.; Madan, Ashvani K.; Snyder, Fred E.; and Stillman, Harold M., 4,984,311, Cl. 4-354.000.
Socci, Roger D. Arm and elbow elevator harness. 4,984,789, Cl. 273-26.00C.
Societe Anonyme dite: Alcatel CIT: *See—*
Boisgontier, Jean Marc; and Caville, Christian, 4,984,866, Cl. 350-96.200.
Societe Industrielle de Combustible Nucleaire: *See—*
Renard, Paul; and Sionnet, Jean, 4,984,642, Cl. 175-329.000.
Societe Nationale des Poudres et Explosifs: *See—*
Wimmer, Eric P.; Lecolier, Serge L.; Ducrocq, Claire A.; Servy, Claudine G.; and Lenfant, Maryse T., 4,985,357, Cl. 435-128.000.
Societe Nationale Elf Aquitaine (Production): *See—*
Arretz, Emmanuel; Auge, Patrick; Mirassou, Alfred; and Landoussy, Claude, 4,985,586, Cl. 560-18.000.
Sodano, Jeanette L.: *See—*
Ibrahim, Nader; and Sodano, Jeanette L., 4,985,236, Cl. 424-52.000.
Sollner, T. C. L. Gerhard: *See—*
Aull, Brian F.; Nichols, Kirby B.; and Sollner, T. C. L. Gerhard, 4,985,621, Cl. 250-213.00A.
Solomon, Peter R.: *See—*
Morrison, Philip W., Jr.; Solomon, Peter R.; and Hamblen, David G., 4,985,858, Cl. 364-557.000.
Soltech, Inc.: *See—*
Nelson, Thomas E., 4,985,106, Cl. 156-276.000.
Somar Corporation: *See—*
Ogitani, Osamu; and Fujii, Ryuichi, 4,985,474, Cl. 522-107.000.
Tachibana, Masao, 4,985,287, Cl. 428-34.500.
Someda, Hitosi: *See—*
Haruna, Kazuo; Ueda, Kanji; Inoue, Masahiro; and Someda, Hitosi, 4,985,052, Cl. 55-26.000.
Sommer, Herbert; Arlt, Dieter; Hartwig, Jurgen; Homeyer, Bernhard; and Matthaei, Hans-Detlef, to Bayer Aktiengesellschaft. Pesticidal thionophosphonic acid(amide) esters. 4,985,415, Cl. 514-118.000.
Sommer, Holger T., to Pacific Scientific Company. Particle size measuring system with coincidence detection. 4,984,889, Cl. 356-336.000.
Sonnichsen, George C.: *See—*
Bellis, Harold E.; Dumas, Donald J.; Sonnichsen, George C.; and Subramanyam, Vinayakam, 4,985,180, Cl. 260-404.000.
Sonntag, Michael: *See—*
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Sony Corporation: *See—*
Motoe, Hisafumi; Tokuhara, Masaharu; and Hoshino, Takaya, 4,985,701, Cl. 341-61.000.
Nakabayashi, Toshiya, 4,985,666, Cl. 318-434.000.
Soya, Takashi: *See—*
Kimizuka, Junichi; Inuyama, Toshihiko; Soya, Takashi; and Noguchi, Yasutaka, 4,985,896, Cl. 372-38.000.
SPA Syspatronic AG: *See—*
Schwartz, Hermann, 4,985,921, Cl. 380-24.000.
Spacesaver Corporation: *See—*
Muth, James C.; and Slattery, James J., 4,984,737, Cl. 238-281.000.
Spain, Raymond G.; and Bailey, Carlos, to Airfoil Textron Inc. Apparatus and method for braiding fiber strands and stuffer fiber strands. 4,984,502, Cl. 87-8.000.
Spang, Peter; Neumann, Peter; and Trauth, Hubert, to BASF Aktiengesellschaft. Benzimidazole-2-carboxanilides. 4,985,566, Cl. 548-328.000.
Sparring Elfa AB: *See—*
Magnusson, Reine, 4,984,694, Cl. 211-186.000.
Speak, Trevor H., to Rolls-Royce PLC. Aerodynamic loading in gas turbine engines. 4,984,423, Cl. 60-39.310.
Specialty Packaging Licensing Company: *See—*
Sledge, Larry C., 4,984,714, Cl. 222-109.000.
Specialty Packaging Licensing Company, Inc.: *See—*
Pierpont, Robert, 4,984,702, Cl. 215-272.000.
Spector, George: *See—*
Hoover, James R.; and Spector, George, 4,984,368, Cl. 30-231.000.
Spectradyne, Inc.: *See—*
Adams, David G., 4,985,761, Cl. 358-84.000.
Spectrum Sciences B.V.: *See—*
Landa, Benzion; Ezuz, Shabtai; Karin, Jakob; and Fenster, Paul, 4,985,732, Cl. 355-256.000.
Spelyng, Walter A.: *See—*
Perry, John G.; and Spelyng, Walter A., 4,985,551, Cl. 536-18.600.
Spencer, Colin W., to Vaqua Limited. Vacuum distillation apparatus and method with pretreatment. 4,985,122, Cl. 203-11.000.
Sperry Marine Inc.: *See—*
Gilligan, Lawrence H.; and Ladd, Charles B., 4,985,773, Cl. 358-211.000.
Spillman, William B., Jr., to Simmonds Precision Products, Inc. Optical grating sensor and method of monitoring with a multi-period grating. 4,985,624, Cl. 250-237.00G.
Spinelli, Harry J.: *See—*
Henry, Cyrus P.; and Spinelli, Harry J., 4,985,160, Cl. 252-51.50R.
Spirac Engineering AB: *See—*
Bruke, Richard, 4,984,477, Cl. 74-89.150.
Spors, Wolfgang. Loudspeaker arrangement. 4,984,653, Cl. 181-148.000.

Spratt, David B.; Virkus, Robert L.; Eklund, Robert H.; and Zorinsky, Eldon J., to Texas Instruments Incorporated. Method for forming a recessed contact bipolar transistor and field effect transistor. 4,985,744, Cl. 357-43.000.

Springer, Jack F., Jr.; Smith, Timothy S.; Cloutier, Cathy A.; Marcantonio, Ben A.; and Willis, Richard A., to KVR Manufacturing Corp. Collapsible tanning booth. 4,984,571, Cl. 128-371.000.

Sprint International Communications Corporation: *See*—
Frankish, Anthony J.; Stewart, Ian B.; and Stockdale, John A., 4,985,889, Cl. 370-94.100.

Square D Company: *See*—
Pum, Frank W.; and Szymaszek, Michael C., 4,985,803, Cl. 361-383.000.

Squire, Edward N., to Du Pont de Nemours, E. I., and Company. Amorphous copolymers of perfluoro-2,2-dimethyl-1,3-dioxole. 4,985,308, Cl. 428-422.000.

Stadele, Norbert; and Maeser, Martin, to Zinser Textilmaschinen GmbH. Textile tube support device having position indicating means. 4,984,422, Cl. 57-281.000.

Stadlbauer, Herta, Wolfram Stadlbauer, Helmut Stadlbauer: *See*—
Stadlbauer, Wilhelm, deceased; Koch, Erwin; Zauner, Franz; Rinesch, Rudolf; and Vanovsek, Wolfgang, 4,985,067, Cl. 75-10.100.

Stadlbauer, Wilhelm, deceased (by Stadlbauer, Herta, Wolfram Stadlbauer, Helmut Stadlbauer); Koch, Erwin; Zauner, Franz; Rinesch, Rudolf; and Vanovsek, Wolfgang, to K.H.T. Know-How-Trading Patent Verwetung GmbH. Process and device for implementing hot chemical processes. 4,985,067, Cl. 75-10.100.

Staendeke, Horst; and Themmler, Ursus, to Hoechst Aktiengesellschaft. Phlegmatized red phosphorus. 4,985,221, Cl. 423-265.000.

Stammler, Walter, to Telefunken Systemtechnik GmbH. Method and apparatus for compiling and evaluating local traffic data. 4,985,705, Cl. 342-69.000.

Stanford, Tania: *See*—
Annett, Martin F.; France, Barry; and Stanford, Tania, 4,984,933, Cl. 405-150.000.

Statz, Robert J.: *See*—
Kamins, Kathryn A.; and Statz, Robert J., 4,985,497, Cl. 525-84.000.

Steamatic, Inc.: *See*—
Wade, Calvin N., 4,984,329, Cl. 15-387.000.

Stearns, Kenneth W.; and McGee, John K., to Stearns & McGee. Treadmill. 4,984,810, Cl. 272-62.000.

Stearns & McGee: *See*—
Stearns, Kenneth W.; and McGee, John K., 4,984,810, Cl. 272-62.000.

Stefenel, Rudolph S.: *See*—
Emmons, Lawrence D.; Mackley, James S.; Stokes, David H.; Stefenel, Rudolph S.; Brisko, William E., Jr.; and Cooper-Hart, Michael A., 4,985,911, Cl. 379-53.000.

Stefko, Bela: *See*—
Kreidl, Janos; Turcsanyi, Peter; Arcs nee Trischler, Zsuzsanna; Stefko, Bela; Meszaros nee Brill, Judit M.; Deutsch nee Juhasz, Ida; Szilbereky, Jeno; Csizer, Eva; and Vezer, Szilard, 4,985,463, Cl. 514-646.000.

Stegemeier, George L.: *See*—
Vinegar, Harold J.; and Stegemeier, George L., 4,984,594, Cl. 134-21.000.

Steiert, Edwin: *See*—
Reiser, Peter; Steiert, Edwin; and Schaffert, Wolfgang, 4,984,736, Cl. 237-2.00A.

Steiner, Joseph M., Jr.: *See*—
Eyl, Kevin A.; Kurkjian, Andrew L.; Lineman, David J.; Pierce, Edward A.; and Steiner, Joseph M., Jr., 4,985,873, Cl. 367-27.000.

Stendel, Wilhelm: *See*—
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 4,985,063, Cl. 71-88.000.

Stengl, Gerhard; and Glavish, Hilton F., to Oesterreichische Investitionskredit Aktiengesellschaft and Ionen Mikrofabrications. Ion beam lithography. 4,985,634, Cl. 250-492.200.

Sterler, Georg; and Bader, Heinz, to Audi AG. Method and apparatus for activating a motor vehicle safety system. 4,985,835, Cl. 364-424.050.

Steudler, Frederick W., Jr., to Val Products, Inc. Nipple for feeding liquids to fowl and/or small animals. 4,984,537, Cl. 119-72.500.

Stevenson, John: *See*—
Barker, Sidney A.; Baggett, Neil; Stevenson, John; George, Raymond D.; De Courcy, David R.; Hammond, Timothy; and Bradley, Martin, 4,985,489, Cl. 524-594.000.

Stewart, Ian B.: *See*—
Frankish, Anthony J.; Stewart, Ian B.; and Stockdale, John A., 4,985,889, Cl. 370-94.100.

Stewart, Lawrence L., Jr., to Philip Morris Incorporated. Low delivery cigarette. 4,984,588, Cl. 131-364.000.

Stice, James D., to Flexmedics Corporation. Flexible guide having two-way shape memory alloy. 4,984,581, Cl. 128-772.000.

Stillman, Harold M.: *See*—
Basile, Peter A.; Madan, Ashvani K.; Snyder, Fred E.; and Stillman, Harold M., 4,984,311, Cl. 4-354.000.

Stilwell, Larry T.: *See*—
Rucker, Klaus G.; Simmons, Walter J.; and Stilwell, Larry T., 4,985,610, Cl. 219-70.000.

Stockdale, John A.: *See*—
Frankish, Anthony J.; Stewart, Ian B.; and Stockdale, John A., 4,985,889, Cl. 370-94.100.

Stockmeier, Thomas: *See*—
Bauer, Friedhelm; and Stockmeier, Thomas, 4,985,741, Cl. 357-34.000.

Stokes, David H.: *See*—
Emmons, Lawrence D.; Mackley, James S.; Stokes, David H.; Stefenel, Rudolph S.; Brisko, William E., Jr.; and Cooper-Hart, Michael A., 4,985,911, Cl. 379-53.000.

Stone Container Corporation: *See*—
Zion, Kenneth J.; and Tison, Allan J., 4,984,734, Cl. 229-109.000.

Stone, Robert J.: *See*—
Campbell, W. Carroll; Evans, Michael W.; Browning, Edward A., Jr.; and Stone, Robert J., 4,985,804, Cl. 361-384.000.

Stoner, David T.: *See*—
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,985,848, Cl. 364-518.000.

Storer, William J. A., to Fisher Controls International, Inc. Force transmitting mechanism for a vortex flowmeter. 4,984,471, Cl. 73-861.240.

Strada, Antonio; Bertschy, Alain; Guoli, Giacomo; and Mowka, Edmund J., Jr., to Newa S.r.l. Centrifugal pump especially for aquariums. 4,985,181, Cl. 261-87.000.

Stramello, Peter: *See*—
Long, Michael E.; and Stramello, Peter, 4,985,772, Cl. 358-181.000.

Straughan, Charles: *See*—
Jordan, Mitchell; Mercer, James C.; Straughan, Charles; and Hudson, Rex D., 4,984,448, Cl. 73-40.50R.

Straw, Jeff; and Sylke, C. Thomas, to Straw, Jeff. Safety enclosure system for medical devices. 4,985,021, Cl. 604-198.000.

Streed, Carl F. Fishing lure having a hinge piece. 4,984,950, Cl. 43-42.130.

Strein, Klaus: *See*—
Zilch, Harald; Mertens, Alfred; Von Der Saal, Wolfgang; Boehm, Erwin; and Strein, Klaus, 4,985,448, Cl. 514-339.000.

Strickland, James N.: *See*—
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Strickland, William C.: *See*—
Mettler, John H.; Johnson, William L.; Strickland, William C.; and Zaderej, Victor V., 4,985,116, Cl. 156-656.000.

Struthers, Scott; Curtis, Jerry; and Reed, Jack, to Dana Innovations. Control knob and adaptor assembly. 4,984,931, Cl. 403-362.000.

Strutz, Heinz: *See*—
Blickle, Peter; Hintzer, Klaus; Schwertfeger, Werner; and Strutz, Heinz, 4,985,594, Cl. 562-851.000.

Strzok, Michael. Motorized skiboard. 4,984,648, Cl. 180-181.000.

Stuckey, William C. Lockable closure cap. 4,984,698, Cl. 215-207.000.

Stusser, Dieter: *See*—
Bruckner, Raimund; Eschner, Axel; Langenfeld, Wilhelm; Oberbach, Manfred; Rothfuss, Hans; and Stusser, Dieter, 4,984,769, Cl. 266-44.000.

Styropack (UK) Limited: *See*—
Jones, David L., 4,984,691, Cl. 206-506.000.

Suarato, Antonino: *See*—
Caruso, Michele; Suarato, Antonino; Angelucci, Francesco; and Arcamone, Federico, 4,985,548, Cl. 536-6.400.

Subramanyam, Vinayakam: *See*—
Bellis, Harold E.; Dumas, Donald J.; Sonnichsen, George C.; and Subramanyam, Vinayakam, 4,985,180, Cl. 260-404.000.

Suchoski, Paul G., Jr.; Findakly, Talal K.; and Leonberger, Frederick J., to United Technologies Corporation. Low-loss proton exchanged waveguides for active integrated optic devices and method of making same. 4,984,861, Cl. 350-96.110.

Sudol, Marion A.: *See*—
Kang, Young C.; Tan, Chee-Teck; Byrne, Brian; Buckholz, Lawrence L., Jr; Sudol, Marion A.; and Boden, Richard M., 4,985,261, Cl. 426-243.000.

Sueta, Hideaki: *See*—
Koishi, Toshio; Ootani, Mikio; Katsuragawa, Seichi; and Sueta, Hideaki, 4,985,519, Cl. 526-249.000.

Sueyoshi, Kouichi: *See*—
Imai, Isao; Ishii, Toshitsugu; and Sueyoshi, Kouichi, 4,985,224, Cl. 423-344.000.

Suga, Hideoki, to Mitsubishi Denki Kabushiki Kaisha. Fault information collection processing system. 4,985,894, Cl. 371-16.500.

Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Hydraulic system for torque converter with lock-up clutch. 4,984,664, Cl. 192-3.300.

Sugano, Mamoru: *See*—
Morita, Shuji; Saito, Ken-Ichi; Ninomiya, Kunihiro; Tobe, Akihiro; Nitta, Issei; and Sugano, Mamoru, 4,985,430, Cl. 514-253.000.

Sugata, Yoshinobu: *See*—
Kuroda, Masami; Sugata, Yoshinobu; and Furusho, Noboru, 4,985,325, Cl. 430-59.000.

Sugawara, Hitoshi; Goto, Minoru; Sakamaki, Yoshitaka; and Fujita, Toshio, to Nippon Steel Chemical Co., Ltd. Polymerization reaction apparatus. 4,985,208, Cl. 422-135.000.

Sugawara, Koichi: *See*—
Okonogi, Shigeo; Tomita, Mamoru; Shimamura, Seiichi; Tomimura, Toshio; Ishibashi, Norio; Miyakawa, Hiroshi; and Sugawara, Koichi, 4,985,246, Cl. 424-115.000.

Sugawara, Michiaki: *See*—
Saito, Muneo; Yamauchi, Yoshio; Kashiwazaki, Hiromi; Sugawara, Michiaki; and Hondo, Toshinobu, 4,984,602, Cl. 137-487.500.

Sugie, Kiyoshi, to Agency of Industrial Science and Technology. Gas separation membrane. 4,985,053, Cl. 55-158.000.
Sugimori, Masaru: *See*—
Takada, Masaharu; and Sugimori, Masaru, 4,985,535, Cl. 528-272.000.
Sugimori, Yoshio; Kimata, Yoshihide; Kurosaki, Tadao; and Urano, Joji, to Nippon Television Network Corporation. Anti-ringing device for television transmission system. 4,985,771, Cl. 358-160.000.
Sugimoto, Eisuke: *See*—
Adachi, Ginya; Imanaka, Nobuhito; Aono, Hiromichi; Sugimoto, Eisuke; Sadaoka, Yoshihiko; Yasuda, Naoshi; Hara, Takeo; and Nagata, Masaki, 4,985,317, Cl. 429-191.000.
Sugimoto, Seiji: *See*—
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Sugimoto, Shigetoshi: *See*—
Kaede, Hiroshi; Koike, Tadahiro; Kato, Shinji; Maeda, Yorishige; Fuwa, Yoshio; Sugimoto, Shigetoshi; Aoyagi, Hikaru; and Shibata, Shinzi, 4,985,092, Cl. 148-326.000.
Sugita, Norifumi; Niimura, Koichi; Oguchi, Yoshiharu; Hirose, Kunitaka; Matsunaga, Kenichi; Oohara, Minoru; Muto, Shigeaki; Kakuchi, Junji; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Lectins and antiretroviral drugs containing the lectins as active ingredient. 4,985,543, Cl. 530-396.000.
Sugitani, Akihiko: *See*—
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Sugitani, Hatuo: *See*—
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Sugitani, Tatsuo: *See*—
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Sugiura, Ikuzo: *See*—
Tashiro, Takeshi; and Sugiura, Ikuzo, 4,984,915, Cl. 400-613.000.
Sugiura, Takashi; Matsuura, Ichiro; Miyauchi, Fumio; and Chiyoshi, Toyoharu, to Ikeda Bussan Co., Ltd. Method of producing a skin-covered pad for a seat. 4,985,189, Cl. 264-26.000.
Sugiyama, Kenji, to Victor Company of Japan, Ltd. Inter-frame predictive encoding system with encoded and transmitted prediction error. 4,985,768, Cl. 358-136.000.
Sullivan, Paul E.: *See*—
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Sulzer Brothers Limited: *See*—
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Sumerix, Carl L. Chemical injector assembly. 4,984,306, Cl. 4-224.000.
Sumitomo Chemical Company, Ltd.: *See*—
Fukui, Yoshiharu; and Kuroda, Kazuhisa, 4,985,480, Cl. 524-108.000.
Funaki, Yuji; and Fukushima, Masayuki, 4,985,570, Cl. 548-513.000.
Kishino, Hiroko; Matsuo, Noritada; Takagaki, Tohei; Tsushima, Kazunori; Yano, Toshihiko; and Torisu, Yoko, 4,985,457, Cl. 514-531.000.
Kohama, Takuji; Minagawa, Fumiyasu; Shinjo, Goro; and Maeda, Kazuyuki, 4,985,413, Cl. 514-79.000.
Minai, Masayoshi; and Higashi, Takayuki, 4,985,590, Cl. 560-184.000.
Mitsuda, Satoshi; Matsuo, Noritada; and Hirohara, Hideo, 4,985,365, Cl. 435-280.000.
Nagasaki, Hideo; Yachigo, Shinichi; Takata, Takeshi; Yamamoto, Hiroki; and Takahashi, Yukoh, 4,985,479, Cl. 524-96.000.
Saito, Yasuhisa; Kanagawa, Shuichi; Watanabe, Katsuya; and Kamio, Kumimasa, 4,985,529, Cl. 528-96.000.
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Yano, Toshihiko; Fujimoto, Izumi; and Takada, Yoji, 4,985,460, Cl. 514-594.000.
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Sumitomo Electric Industries, Ltd.: *See*—
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Sumitomo Rubber Industries, Ltd.: *See*—
Yamada, Mikio; and Nakamura, Yoshinobu, 4,984,804, Cl. 273-235.00R.
Summagraphics Corporation: *See*—
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Sunada, Motoki: *See*—
Noguchi, Michio; Mori, Kazushige; Higashino, Nobuo; and Sunada, Motoki, 4,984,957, Cl. 414-723.000.
Sunahara, Kazuo; Ichimatsu, Tsuneo; and Aoki, Yumiko, to Asahi Glass Company, Ltd. Conductive paste compositions and ceramic substrates. 4,985,376, Cl. 501-22.000.
Sunami, Sadakatsu. Car theft proofing system. 4,985,693, Cl. 340-426.000.
Sunami, Sadakatsu. Car theft proofing system. 4,985,694, Cl. 340-426.000.
Sundberg, Anders: *See*—
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Sundstrand Corporation: *See*—
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Laycock, John E.; and Ramirez, Ray C., 4,985,142, Cl. 210-130.000.
Lichtfuss, Gerhardt E., 4,984,625, Cl. 165-104.250.
Shekleton, Jack R., 4,984,424, Cl. 60-39.940.
Von Stoutenborough, Eric; and Lang, David J., 4,984,473, Cl. 73-862.190.
Sung, Rodney L.; and Daly, Daniel T., to Texaco Inc. Poly(oxybutylene)poly(oxyethylene)diamine compound and ORI-inhibited motor fuel composition. 4,985,047, Cl. 44-433.000.
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Richardson-Vicks, Inc. Analgesic and anti-inflammatory compositions comprising diphenhydramine and methods of using same. 4,985,459, Cl. 514-561.000.
Sunstar Engineering Inc.: *See*—
Takada, Masaharu; and Sugimori, Masaru, 4,985,535, Cl. 528-272.000.
Sunstar Kabushiki Kaisha: *See*—
Nakamura, Yoshiaki; Fujibayashi, Ryoichi; and Murakami, Yuji, 4,985,234, Cl. 424-45.000.
Suntory Limited: *See*—
Ishiguro, Masaji; Iwata, Hiromitsu; Nakatsuka, Takashi; Nakayama, Kiyoharu; Miyahara, Osamu; and Noguchi, Kenichi, 4,985,575, Cl. 549-484.000.
Sutrina, Thomas A.: *See*—
Crowe, Lawrence E.; and Sutrina, Thomas A., 4,985,752, Cl. 357-79.000.
Suwa, Kaname: *See*—
Sekine, Kazumi; and Suwa, Kaname, 4,984,916, Cl. 400-613.100.
Suzuki, Akira: *See*—
Uemura, Hiroyuki; Suzuki, Akira; Shimada, Masaru; Mochizuki, Hidehiro; and Morohoshi, Naoya, 4,985,397, Cl. 503-227.000.
Suzuki, Atsushi: *See*—
Nakashima, Norihiko; Kanoh, Yoshiji; Suzuki, Atsushi; and Ueda, Sadashi, 4,985,390, Cl. 503-208.000.
Suzuki, Eiiti: *See*—
Suzuki, Hiromi; Suzuki, Eiiti; and Mizuno, Isao, 4,984,394, Cl. 51-165.900.
Suzuki, Haruo; and Satoh, Tohru, to Jidosha Kiki Co., Ltd. Three chamber brake booster with variable pressure passages having a minimum channel length. 4,984,507, Cl. 91-376.00R.
Suzuki, Hiromi; Suzuki, Eiiti; and Mizuno, Isao, to 501 Kirin Beer Kabushikikaisha. Method and apparatus for grinding straight-edged cutting tools to a fine finish. 4,984,394, Cl. 51-165.900.
Suzuki, Katsuyuki: *See*—
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizou, 4,985,362, Cl. 435-226.000.
Suzuki, Kenichi; Inada, Haruaki; Kiue, Akira; and Sano, Tetsuro, to Nikken Chemicals Co., Ltd. 1,4-dihydropyridine derivative. 4,985,558, Cl. 546-256.000.
Suzuki, Kenichirou: *See*—
Akiyama, Shunichi; Sato, Norio; Suzuki, Kenichirou; Yoshimoto, Taisuke; and Nakasho, Hideaki, 4,985,211, Cl. 422-171.000.
Suzuki, Kouji, to Brother Kogyo Kabushiki Kaisha. Photo and heat sensitive recording medium and image recording method. 4,985,346, Cl. 430-350.000.
Suzuki Motor Company Limited: *See*—
Ogawa, Fumihiko; Hori, Kazunobu; Asai, Keiichi; and Watanabe, Tomoyoshi, 4,984,842, Cl. 296-155.000.
Suzuki, Takashi: *See*—
Chiba, Tadahiro; Miyazawa, Kiyoshi; Uzuka, Makoto; and Suzuki, Takashi, 4,985,425, Cl. 514-222.200.
Suzuki, Toshihiko: *See*—
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizou, 4,985,362, Cl. 435-226.000.
Suzuki, Toshio: *See*—
Yahagi, Kazuyuki; and Suzuki, Toshio, 4,985,239, Cl. 424-70.000.
Suzuki, Toshitake: *See*—
Asada, Toshiyuki; Higashiyama, Yasuhiko; Nakawaki, Yasunori; Suzuki, Toshitake; Abe, Akiharu; and Moriguchi, Naoki, 4,985,011, Cl. 475-278.000.
Suzuki, Yoshiki: *See*—
Sekine, Kunio; Araki, Daisuke; and Suzuki, Yoshiki, 4,985,242, Cl. 424-85.400.
Suzuki, Yuji: *See*—
Matsumoto, Takeshi; Suzuki, Yuji; Kumagai, Masahiro; and Uchibori, Shinya, 4,985,288, Cl. 428-40.000.
Sweeney, Harold E., to GTE Government Systems Corporation. Method of optically and remotely sensing subsurface water temperature. 4,984,903, Cl. 374-123.000.
Swieringa, Morris K.: *See*—
Lingertat, Arnold; and Swieringa, Morris K., 4,985,025, Cl. 604-390.000.
Syfrig, Werner: *See*—
Balzli, Samuel; and Syfrig, Werner, 4,984,770, Cl. 266-106.000.
Sylke, C. Thomas: *See*—
Straw, Jeff; and Sylke, C. Thomas, 4,985,021, Cl. 604-198.000.
Szarka, Sandor, to Precision Screen Machines, Inc. Vacuum track and pallets. 4,984,960, Cl. 414-752.000.

Szeto, Danny; and Szeto, Lin K. Hinge mortise guide and cutter. 4,984,613, Cl. 144-27.000.
Szeto, Lin K.: *See*—
Szeto, Danny; and Szeto, Lin K., 4,984,613, Cl. 144-27.000.
Szilbereky, Jeno : *See*—
Kreidl, Janos; Turcsanyi, Peter; Arcs nee Trischler, Zsuzsanna; Stefko, Bela; Meszaros nee Brill, Judit M.; Deutsch nee Juhasz, Ida; Szilbereky, Jeno ; Csizer, Eva; and Vezer, Szilard, 4,985,463, Cl. 514-646.000.
Szymaszek, Michael C.: *See*—
Pum, Frank W.; and Szymaszek, Michael C., 4,985,803, Cl. 361-383.000.
Tabak, Samuel A., to Mobil Oil Corporation. Conversion system for converting oxygenates to hydrocarbons. 4,985,203, Cl. 422-190.000.
Tabata, Munehiro; Hayashi, Chiharu; Isozaki, Yasuhito; Okano, Kazuyuki; and Hasegawa, Yo, to Matsushita Electric Industrial Co., Ltd. Process for producing a base metal thin film and an electronic device using the same. 4,985,071, Cl. 75-246.000.
Tachi, Shinichi: *See*—
Okudaira, Sadayuki; Kawakami, Hiroshi; Kure, Tokuo; Tsujimoto, Kazunori; and Tachi, Shinichi, 4,985,114, Cl. 156-643.000.
Tachibana, Masao, to Somar Corporation. Light-stabilized, vinyl chloride resin body. 4,985,287, Cl. 428-34.500.
Tachikawa, Hiromichi: *See*—
Yokoya, Hiroaki; Tachikawa, Hiromichi; and Sato, Hideo, 4,985,323, Cl. 430-49.000.
Tachuk, Leo; and Tulley, Michael K., to Trison Telecommunications Ltd. Party line converter. 4,985,916, Cl. 379-178.000.
Tada, Nobuo: *See*—
Irube, Makoto; Nakajima, Junjiro; Umehara, Hajime; Tada, Nobuo; and Ajima, Masayoshi, 4,985,199, Cl. 376-442.000.
Tada, Tatsuya; and Yamamoto, Yasuyoshi, to Canon Kabushiki Kaisha. Image-forming apparatus. 4,985,823, Cl. 346-160.100.
Tada, Yasuo: *See*—
Yasui, Katsuaki; Tada, Yasuo; and Takashima, Akira, 4,984,466, Cl. 73-721.000.
Taguchi, Nobuyoshi: *See*—
Kawakami, Tetsuji; Imai, Akihiro; Taguchi, Nobuyoshi; Murata, Yukichi; and Hirota, Takao, 4,985,396, Cl. 503-227.000.
Matsuda, Hiromu; Taguchi, Nobuyoshi; Imai, Akihiro; and Yubakami, Keiichi, 4,985,399, Cl. 503-227.000.
Taiho Industries Co., Ltd.: *See*—
Ise, Osao; Kanazawa, Hideto; and Ishida, Masahiko, 4,985,077, Cl. 106-22.000.
Taipale, Seppo: *See*—
Hakkarainen, Merja; and Taipale, Seppo, 4,985,084, Cl. 139-383.00A.
Taiyo Fishery Co., Ltd.: *See*—
Watanabe, Etsuo; and Hoshi, Masakazu, 4,985,125, Cl. 204-153.120.
Takabayashi, Naoki: *See*—
Kurematsu, Masayuki; Koboshi, Shigeharu; Kobayashi, Kazuhiro; and Takabayashi, Naoki, 4,985,118, Cl. 159-47.300.
Takada, Hideki, to Kabushiki Kaisha Toshiba. Method of manufacturing a lateral transistor. 4,985,367, Cl. 437-32.000.
Takada, Masaharu; and Sugimori, Masaru, to Sunstar Engineering Inc. Moisture-curable hot-melt adhesive composition. 4,985,535, Cl. 528-272.000.
Takada, Masaki: *See*—
Takahashi, Mamoru; Imamura, Shigeyuki; and Takada, Masaki, 4,985,360, Cl. 435-189.000.
Takada, Mitsuru; Itoh, Hiroshi; and Takahashi, Tokuyuki, to Toyota Jidosha Kabushiki Kaisha. Hydraulic pressure control device for automatic transmission for vehicle including reverse stage prevention system. 4,984,486, Cl. 74-868.000.
Takada, Yoji: *See*—
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Yano, Toshihiko; Fujimoto, Izumi; and Takada, Yoji, 4,985,460, Cl. 514-594.000.
Takada, Yoshihiro: *See*—
Fujioka, Keiji; Sato, Shigeji; Tamura, Nobuhiko; and Takada, Yoshihiro, 4,985,253, Cl. 424-488.000.
Takagaki, Tohei: *See*—
Kishino, Hiroko; Matsuo, Noritada; Takagaki, Tohei; Tsushima, Kazunori; Yano, Toshihiko; and Torisu, Yoko, 4,985,457, Cl. 514-531.000.
Takagi, Hiroshi: *See*—
Mori, Yoshiaki; Fujino, Masaru; Takagi, Hiroshi; and Sakabe, Yukio, 4,985,381, Cl. 501-136.000.
Takagi, Izumi, to Brother Kogyo Kabushiki Kaisha. Image reading apparatus. 4,985,620, Cl. 250-208.100.
Takagi, Noboru; and Obata, Mitsuyoshi, to Kabushiki Kaisha Kobe Seiko Sho. Internal pressure explosion-proof construction for electrically-driven robot. 4,985,653, Cl. 310-88.000.
Takago, Toshio: *See*—
Kishita, Hirofumi; Yamaguchi, Kouichi; and Takago, Toshio, 4,985,526, Cl. 528-15.000.
Takahashi, Akira: *See*—
Ohta, Kenji; Takahashi, Akira; Katayama, Hiroyuki; Hirokane, Junji; and Murakami, Yoshiteru, 4,985,885, Cl. 369-275.100.
Takahashi, Daisuke: *See*—
Onmori, Shozo; Takahashi, Daisuke; and Oishi, Kengo, 4,985,798, Cl. 360-132.000.
Takahashi, Haruo: *See*—
Sawai, Kiichi; Takeda, Jun; Seino, Yutaka; Imura, Hiroo; Tanaka, Kenichi; Takahashi, Haruo; Mitani, Takahiko; and Kurono, Masayasu, 4,985,356, Cl. 435-69.400.
Takahashi, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Device for detecting a mass flow of air fed into an engine cylinder. 4,984,456, Cl. 73-118.200.
Takahashi, Hisamitsu: *See*—
Hashimoto, Noboru; Sawada, Yasushi; Yoden, Hiroyoshi; Deki, Shigehito; and Takahashi, Hisamitsu, 4,985,225, Cl. 423-412.000.
Takahashi, Ken: *See*—
Ihara, Keita; Yohda, Hiroshi; Sawai, Eisuke; and Takahashi, Ken, 4,985,796, Cl. 360-122.000.
Takahashi, Koichi: *See*—
Tokutake, Nobuo; Takahashi, Koichi; Satoh, Yoshiyuki; Kohara, Hidekatsu; and Nakayama, Toshimasa, 4,985,333, Cl. 430-192.000.
Takahashi, Kunimasa; Kameda, Takashi; Yoshikawa, Masato; and Teranishi, Teruo, to Mitsubishi Petrochemical Company Limited. Production of carbonaceous powders and their granulation. 4,985,184, Cl. 264-6.000.
Takahashi, Mamoru; Imamura, Shigeyuki; and Takada, Masaki, to Toyo Jozo Kabushiki Kaisha. Novel bilirubin oxidase which has a substrate specifity to bilirubin, but not to biliverdin, catechol and hemin. 4,985,360, Cl. 435-189.000.
Takahashi, Masaaki: *See*—
Sugita, Norifumi; Niimura, Koichi; Oguchi, Yoshiharu; Hirose, Kunitaka; Matsunaga, Kenichi; Oohara, Minoru; Muto, Shigeaki; Kakuchi, Junji; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 4,985,543, Cl. 530-396.000.
Takahashi, Nobuaki: *See*—
Kojima, Masahiro; Nishikawa, Seiichi; and Takahashi, Nobuaki, 4,984,485, Cl. 74-866.000.
Takahashi, Noriaki: *See*—
Nagasaka, Hideki; and Takahashi, Noriaki, 4,985,470, Cl. 522-26.000.
Takahashi, Noriko: *See*—
Saito, Masao; Tsukahara, Kengo; Takahashi, Noriko; and Onda, Yuzi, 4,985,581, Cl. 558-327.000.
Takahashi, Satoru: *See*—
Wada, Nobuhide; Saito, Yoshihiro; Kusano, Shoji; Toyokawa, Yasuhumi; Miyazawa, Takeshige; Kajiwara, Ikuo; and Takahashi, Satoru, 4,985,066, Cl. 71-92.000.
Takahashi, Shinsuke; Shibata, Norio; and Sato, Tsunehiko, to Fuji Photo Film Co., Ltd. Application device. 4,984,533, Cl. 118-419.000.
Takahashi, Takehiko; Saito, Hideo; Watanabe, Takashi; and Kaneko, Tomihioro, to Combi Co., Ltd. Shopping pushcart. 4,984,813, Cl. 280-30.000.
Takahashi, Takeshi: *See*—
Takahashi, Yasuyuki; Yoshida, Toshiro; and Takahashi, Takeshi, 4,985,173, Cl. 252-314.000.
Takahashi, Tokuyuki: *See*—
Takada, Mitsuru; Itoh, Hiroshi; and Takahashi, Tokuyuki, 4,984,486, Cl. 74-868.000.
Takahashi, Yasuyuki; Yoshida, Toshiro; and Takahashi, Takeshi, to Meiji Milk Products Company Limited. Process for producing a W/O/W type multiple emulsion for medicines, cosmetics, etc. 4,985,173, Cl. 252-314.000.
Takahashi, Yoshinori; Misaki, Jun; and Karaki, Takayuki, to Zojirushi Corporation. Automatic bread-making device. 4,984,512, Cl. 99-327.000.
Takahashi, Yukoh: *See*—
Nagasaki, Hideo; Yachigo, Shinichi; Takata, Takeshi; Yamamoto, Hiroki; and Takahashi, Yukoh, 4,985,479, Cl. 524-96.000.
Takaishi, Naotake: *See*—
Yano, Shinji; Kawamata, Akira; Minematsu, Yoshihiro; Akazaki, Shuichi; Zama, Mitsuko; Imokawa, Genji; Takaishi, Naotake; Ohtomo, Tsuyoshi; and Komori, Takashi, 4,985,547, Cl. 536-4.100.
Takajo, Shigeaki: *See*—
Ogura, Kuniaki; Oota, Junichi; Abe, Teruyoshi; and Takajo, Shigeaki, 4,985,309, Cl. 428-570.000.
Takamatsu, Hideo: *See*—
Nishikawa, Makoto; Takamatsu, Hideo; Ishii, Masao; and Minatono, Shobu, 4,985,499, Cl. 525-89.000.
Takami, Susumu: *See*—
Okada, Osamu; Takami, Susumu; Kotani, Tamotu; Mori, Satoshi; Fujita, Hiroki; Fukumura, Naoko; and Ippommatsu, Masamichi, 4,985,074, Cl. 75-444.000.
Takano, Seiichi; Shimazaki, Yohichi; Sekiguchi, Yoshinori; and Ogasawara, Kunio, to Takano, Seiichi. 6-membered lactones useful as intermediates for antilipemic mevalonic acid lactones. 4,985,571, Cl. 549-283.000.
Takano, Toshiro: *See*—
Karakama, Tadao; Ishizaki, Naoki; Takano, Toshiro; and Nunotani, Sadao, 4,984,603, Cl. 137-489.000.
Takao Kinzoku Kogyo Co., Ltd.: *See*—
Iida, Hajime; and Nakamura, Tadashi, 4,985,611, Cl. 219-87.000.
Takase, Junji: *See*—
Fujii, Sadao; Takase, Junji; and Kawai, Hideki, 4,985,531, Cl. 528-171.000.
Takashi, Terumi: *See*—
Mano, Hiroyuki; Takashi, Terumi; Fujisawa, Kazuhiro; Hasegawa, Kaoru; Matsumoto, Shinzo; and Fujita, Mitsuhisa, 4,985,698, Cl. 340-784.000.
Takashima, Akira: *See*—
Yasui, Katsuaki; Tada, Yasuo; and Takashima, Akira, 4,984,466, Cl. 73-721.000.

Takashima, Masanobu: *See*—
Ikeda, Kenji; Iwakura, Ken; and Takashima, Masanobu, 4,985,391, Cl. 503-208.000.

Takata, Takeshi: *See*—
Nagasaki, Hideo; Yachigo, Shinichi; Takata, Takeshi; Yamamoto, Hiroki; and Takahashi, Yukoh, 4,985,479, Cl. 524-96.000.

Takatsuki, Toyohiko; Kirimoto, Atsushi; and Nanba, Toshiyuki, to Zojirushi Corporation. Vacuum storage device. 4,984,611, Cl. 141-65.000.

Takaya, Takao; Tozuka, Zenzaburo; Yasuda, Nobuyoshi; and Kawabata, Kohji, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,985,555, Cl. 540-229.000.

Takayama, Syuichi: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 4,984,575, Cl. 128-660.030.

Take, Masafumi; Takeda, Haruo; and Nakamura, Nobutaka, to Seiko Instruments, Inc. Amplitude measurement device for viscoelasticity analysis. 4,984,469, Cl. 73-770.000.

Takeda, Atsushi: *See*—
Maeshima, Katsuyoshi; Takeda, Atsushi; Arimoto, Shinobu; and Hasegawa, Shizuo, 4,985,760, Cl. 358-80.000.

Takeda Chemical Industries, Ltd.: *See*—
Terao, Shinji; and Nishikawa, Kohei, 4,985,447, Cl. 514-333.000.

Takeda, Haruo; Hananoi, Toshihiro; and Kawachiya, Sachiko, to Hitachi, Ltd. Image data filing system and image data correcting method. 4,985,930, Cl. 382-56.000.

Takeda, Haruo: *See*—
Take, Masafumi; Takeda, Haruo; and Nakamura, Nobutaka, 4,984,469, Cl. 73-770.000.

Takeda, Hideo: *See*—
Achiwa, Kazuo; and Takeda, Hideo, 4,985,567, Cl. 548-412.000.

Takeda, Jun: *See*—
Sawai, Kiichi; Takeda, Jun; Seino, Yutaka; Imura, Hiroo; Tanaka, Kenichi; Takahashi, Haruo; Mitani, Takahiko; and Kurono, Masayasu, 4,985,356, Cl. 435-69.400.

Takeda, Makoto: *See*—
Nagashima, Nobuyoshi; Matsumoto, Toshio; Yasuda, Shuhei; Kawaguchi, Takafumi; and Takeda, Makoto, 4,985,770, Cl. 358-152.000.

Takehana, Sakae: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 4,984,575, Cl. 128-660.030.

Takei, Akihiko: *See*—
Sano, Shoichi; Furukawa, Yoshimi; Takei, Akihiko; Nishi, Yutaka; and Ohno, Yasuaki, 4,984,646, Cl. 180-79.100.

Takei, Toshiyuki: *See*—
Matsuyama, Futoshi; Hirose, Akira; and Takei, Toshiyuki, 4,984,351, Cl. 29-568.000.

Takekawa, Naomitsu: *See*—
Sekine, Takayuki; and Takekawa, Naomitsu, 4,984,566, Cl. 128-90.000.

Takemoto, Hideaki: *See*—
Kurita, Akitsugu; Takezawa, Yoshiaki; Saitoh, Nobuhiro; Shimada, Takehisa; and Takemoto, Hideaki, 4,985,286, Cl. 428-34.700.

Takemoto, Kazuo: *See*—
Fujiwara, Takuji; Yoshimura, Hiroshi; Ishii, Kozo; and Takemoto, Kazuo, 4,984,484, Cl. 74-866.000.

Takemura, Hiroo: *See*—
Horiike, Satoru; Takemura, Hiroo; and Yamamoto, Toshiteru, 4,984,650, Cl. 180-227.000.

Takemura, Tetsu; Ichinose, Hidetoshi; Ohkubo, Keisuke; Sugitani, Akihiko; and Okamoto, Toshiyuki, to Ushio Denki Kabushiki Kaisha. Method for producing a fused silica envelope for discharge lamp. 4,985,275, Cl. 427-106.000.

Takenouchi, Hiroaki: *See*—
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Tsuruoka, Ichiro; Takenouchi, Hiroaki; and Echigo, Katsuhiro, 4,985,733, Cl. 355-282.000.

Takeuchi, Masuho: *See*—
Ishikawa, Takamichi; Nomura, Masumi; and Takeuchi, Masuho, 4,985,190, Cl. 264-122.000.

Takeuchi, Nobuyuki: *See*—
Furuya, Koichi; Nakashima, Hiroshi; Iida, Yasunobu; Takeuchi, Nobuyuki; and Nakamura, Masato, 4,985,312, Cl. 428-627.000.

Takeuchi, Yasuhiro: *See*—
Nishino, Atsushi; Kimura, Kunio; Takeuchi, Yasuhiro; and Ishihara, Koji, 4,985,291, Cl. 428-116.000.

Takezawa, Yoshiaki: *See*—
Kurita, Akitsugu; Takezawa, Yoshiaki; Saitoh, Nobuhiro; Shimada, Takehisa; and Takemoto, Hideaki, 4,985,286, Cl. 428-34.700.

Taki, Hiromitsu: *See*—
Eguchi, Kazuhiro; Ochiai, Eiichi; Ito, Shinichiro; Yoneda, Takehiko; Taki, Hiromitsu; Noguchi, Toshiharu; Kiyosue, Kuniaki; Yoshida, Akiro; Sagawa, Morikazu; and Makimoto, Mitsuo, 4,985,690, Cl. 333-222.000.

Takiguchi, Yasuyuki; Kanemoto, Akihiko; Yokoi, Kenya; Iimura, Haruo; Enomoto, Takamichi; and Kamoi, Sumio, to Ricoh Company, Ltd. Liquid crystal display device. 4,984,873, Cl. 350-337.000.

Takiguchi, Yo; Tani, Tokio; Kawashima, Ichiro; Ohsumi, Jun; Furukawa, Hidehiko; and Ohmine, Toshinori, to Sankyo Company, Limited. Human pancreatic elastase. 4,985,361, Cl. 435-218.000.

Takise, Saburou: *See*—
Ariga, Masahiro; Takise, Saburou; and Fujii, Aturo, 4,984,554, Cl. 123-516.000.

Talamas, Elie, Jr.: *See*—
Bianco, Frank J.; Owen, Charles W.; and Talamas, Elie, Jr., 4,985,632, Cl. 250-372.000.

Tallman, Jeff K. Anti-slip locking device. 4,984,337, Cl. 24-16.00R.

Tam, Wilson, to Du Pont de Nemours, E. I., and Company. Nonlinear optical device from 3-methyl-4-methoxy-4'-nitrostilbene. 4,985,178, Cl. 252-587.000.

Tamaru, Shinji; Kubo, Motonobu; Tanaka, Osamu; and Kobayashi, Tsutomu, to Daikin Industries, Inc. Composite materials. 4,985,297, Cl. 428-260.000.

Tamfelt Oy AB: *See*—
Hakkarainen, Merja; and Taipale, Seppo, 4,985,084, Cl. 139-383.00A.

Tamura, Nobuhiko: *See*—
Fujioka, Keiji; Sato, Shigeji; Tamura, Nobuhiko; and Takada, Yoshihiro, 4,985,253, Cl. 424-488.000.

Tan, Chee-Teck: *See*—
Kang, Young C.; Tan, Chee-Teck; Byrne, Brian; Buckholz, Lawrence L., Jr; Sudol, Marion A.; and Boden, Richard M., 4,985,261, Cl. 426-243.000.

Tan, Ryouji: *See*—
Kumagai, Yuugo; Tan, Ryouji; Ikeda, Takashi; Fujii, Tetsuya; Okada, Chiaki; Higashida, Osamu; Sugitani, Hatuo; and Fukasawa, Masato, 4,985,328, Cl. 430-110.000.

Tanaka, Chikao; Ito, Setsuro; Nakao, Yasumasa; and Maeda, Kei, to Asahi Glass Company Ltd. Glass-ceramic article and method for its production. 4,985,375, Cl. 501-5.000.

Tanaka, Hiroaki: *See*—
Nishikawa, Toshio; Tanaka, Hiroaki; and Shinmura, Satoru, 4,985,709, Cl. 343-787.000.

Tanaka, Hiroshi: *See*—
Yato, Tadao; and Tanaka, Hiroshi, 4,985,183, Cl. 264-0.500.

Tanaka, Hisao: *See*—
Yoshida, Nobuyuki; Tanaka, Hisao; and Fukuyama, Masahiro, 4,985,507, Cl. 525-387.000.

Tanaka, Kazuo: *See*—
Akiyama, Setsuo; Monobe, Hisanobu; Naito, Kazuo; Honda, Toshio; and Tanaka, Kazuo, 4,985,510, Cl. 525-427.000.

Tanaka, Kenichi: *See*—
Sawai, Kiichi; Takeda, Jun; Seino, Yutaka; Imura, Hiroo; Tanaka, Kenichi; Takahashi, Haruo; Mitani, Takahiko; and Kurono, Masayasu, 4,985,356, Cl. 435-69.400.

Tanaka Kikinzoku Kogyo K.K.: *See*—
Tsurumi, Kazunori; Nakamura, Toshihide; and Sato, Akira, 4,985,386, Cl. 502-185.000.

Tanaka, Masaki: *See*—
Yamada, Koichiro; Tanaka, Masaki; Ohba, Toshio; and Ohashi, Hiroshi, 4,985,155, Cl. 252-8.600.

Tanaka, Masami: *See*—
Hata, Kazuyoshi; and Tanaka, Masami, 4,984,876, Cl. 350-423.000.

Tanaka, Osamu: *See*—
Tamaru, Shinji; Kubo, Motonobu; Tanaka, Osamu; and Kobayashi, Tsutomu, 4,985,297, Cl. 428-260.000.

Tanaka, Shigeki; and Satoo, Hiroki, to Sharp Kabushiki Kaisha. Automatic dialing apparatus and method of automatic dialing. 4,985,918, Cl. 379-356.000.

Tanaka, Shigeyoshi; and Yanagi, Shigenori, to Fujitsu Limited. Track access control system for disk system, having eccentricity correction means. 4,985,882, Cl. 369-44.320.

Tanaka, Tadashi: *See*—
Matsumura, Kazuo; Nagata, Mitsuhiro; and Tanaka, Tadashi, 4,985,097, Cl. 156-87.000.

Tanaka, Teruo: *See*—
Hamanaka, Naoki; Tanaka, Teruo; Omoda, Koichiro; Nagashima, Shigeo; Nakagoshi, Junji; and Ojima, Kazuo, 4,985,827, Cl. 364-200.000.

Tanaka, Toshio: *See*—
Ohashi, Mitsuo; Awano, Katsuya; Tanaka, Toshio; and Kimura, Tetsuya, 4,985,585, Cl. 560-9.000.

Tanaka, Yoshie: *See*—
Fujimoto, Kotaro; Tanaka, Yoshie; Kawahara, Hironobu; and Sato, Yoshiaki, 4,985,113, Cl. 156-643.000.

Tanaka, Yoshiyuki: *See*—
Kano, Kiyoshi; Kaku, Nobuyuki; Shigemura, Tatsuya; Tanaka, Yoshiyuki; Fukagawa, Yoshihiro; and Uesugi, Masaki, 4,985,788, Cl. 360-85.000.

Tanaka, Yuichi: *See*—
Hiramatsu, Takeo; and Tanaka, Yuichi, 4,984,483, Cl. 74-866.000.

Tandeski, David A.: *See*—
Sather, Keith O.; Gade, Edward R.; Tandeski, David A.; and Olson, Lawrence E., 4,984,360, Cl. 29-890.053.

Tani, Hiroji: *See*—
Watanabe, Shizuharu; Tani, Hiroji; and Kasanami, Tohru, 4,985,176, Cl. 252-521.000.

Tani, Tokio: *See*—
Takiguchi, Yo; Tani, Tokio; Kawashima, Ichiro; Ohsumi, Jun; Furukawa, Hidehiko; and Ohmine, Toshinori, 4,985,361, Cl. 435-218.000.

Tanigawa, Shigeho: *See*—
Iwasaki, Katsunori; Nozawa, Yasuto; and Tanigawa, Shigeho, 4,985,086, Cl. 148-101.000.

Taniguchi, Akira: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 4,984,575, Cl. 128-660.030.

Taniji, Yukio, to NEC Corporation. Method of driving solid-state imaging element. 4,985,776, Cl. 358-213.230.

Tanikawa, Hirohide: *See*—
Sakashita, Kiichiro; Tanikawa, Hirohide; Yoshida, Satoshi; Nakahara, Toshiaki; Matsushige, Naoki; Fujiwara, Masatsugu; and Mitsuhashi, Yasuo, 4,985,327, Cl. 430-106.600.

Tanikawa, Miyoshi: *See*—
Akimoto, Kazuo; Hirai, Toshiaki; and Tanikawa, Miyoshi, 4,985,724, Cl. 354-400.000.

Tanimoto, Yasufumi: *See*—
Kawano, Hisaaki; and Tanimoto, Yasufumi, 4,985,736, Cl. 355-311.000.

Tanner, Paul R.; Nunn, Randolph G., Jr.; and Luebbe, John P., to Procter & Gamble Company, The. Low residue antiperspirant sticks. 4,985,238, Cl. 424-66.000.

Taranto, Michael V.: *See*—
Camire, Alexis L.; Ejike, Ofomata E.; Krumhar, Kim C.; and Taranto, Michael V., 4,985,262, Cl. 426-302.000.

Tarika, Elio E.: *See*—
Niaura, Vitas; Oxley, Jeffery A.; and Tarika, Elio E., 4,985,260, Cl. 426-87.000.

Tashiro, Takeshi; and Sugiura, Ikuzo, to Tokyo Electric Co., Ltd. Web holding device. 4,984,915, Cl. 400-613.000.

Tatsumi, Norio: *See*—
Seino, Toshio; and Tatsumi, Norio, 4,984,435, Cl. 62-434.000.

Taurand, Gerard: *See*—
Garret, Claude; Guyon, Claude; Plau, Bernard; and Taurand, Gerard, 4,985,419, Cl. 514-211.000.

Taylor, Donald L.: *See*—
Foley, Clark P.; and Taylor, Donald L., 4,985,844, Cl. 364-487.000.

Taylor, Gary L. Automobile enclosure. 4,984,399, Cl. 52-64.000.

Taylor, Joann M.; McManus, Paul A.; Murch, Gerald M.; Rochat, Roxanna F.; and Weiman, Novia A., to Tektronix, Inc. Display-based color system. 4,985,853, Cl. 364-521.000.

Taylor, Thomas N.: *See*—
Sampath, Barbara A.; Matysek, James F.; and Taylor, Thomas N., 4,985,729, Cl. 355-206.000.

TDW Delaware, Inc.: *See*—
Cho, Hyun J.; and Rankin, William J., 4,984,322, Cl. 15-104.061.

Techmedica, Inc.: *See*—
Buss, Rick A.; and Davis, Wilbur M., 4,985,031, Cl. 606-82.000.

Tecumseh Products Company: *See*—
Itameri-Kinter, Terry; and Sauerbrey, David W., 4,984,973, Cl. 417-422.000.

Tegeler, John J.; and Shoger, Kirk D. Arylthiadiazolylsulfonamides and derivatives. 4,985,450, Cl. 514-361.000.

Teicher, Beverly A., to Dana Farber Cancer Institute, Inc. Platinum complexes of azodiazonium dyes as anti-tumor agents. 4,985,416, Cl. 514-150.000.

Tekeyan, Haig. Safety key for toolroom lathe chuck. 4,984,844, Cl. 279-1.00K.

Tektronix, Inc.: *See*—
Foley, Clark P.; and Taylor, Donald L., 4,985,844, Cl. 364-487.000.
Taylor, Joann M.; McManus, Paul A.; Murch, Gerald M.; Rochat, Roxanna F.; and Weiman, Novia A., 4,985,853, Cl. 364-521.000.

Tel Kyushu Limited: *See*—
Ushijima, Mitsuru; and Akimoto, Masami, 4,985,722, Cl. 354-319.000.

Telediffusion de France: *See*—
Cohen, Herve ; and Fouillet, Jean-Marie, 4,985,901, Cl. 375-10.000.

Telefonaktiebolaget L. M. Ericsson: *See*—
Jonsson, Bjorn E. R.; Johnson, Sten E.; Kling, Lars-Orjan; and Avsan, Oleg, 4,985,826, Cl. 364-200.000.
Lindahl, Per A. A., 4,984,990, Cl. 439-63.000.

Telefunken Systemtechnik GmbH: *See*—
Stammler, Walter, 4,985,705, Cl. 342-69.000.

Telesis Controls Corporation: *See*—
Cyphert, David L.; and Robertson, John A., 4,985,715, Cl. 346-140.00R.

Teljin Limited: *See*—
Sekine, Kunio; Araki, Daisuke; and Suzuki, Yoshiki, 4,985,242, Cl. 424-85.400.

ten Berge, Eduardus F. A., to AMP Incorporated. Optical connector and method of forming an optical splice. 4,984,868, Cl. 350-96.210.

Tengler, John N.; and Gobets, Roy A., to Minnesota Mining and Manufacturing Co. Shielded cable termination assembly. 4,985,000, Cl. 439-497.000.

Terada, Naofumi: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,573, Cl. 549-402.000.
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,574, Cl. 549-402.000.

Teramoto, Katsumi: *See*—
Yamashita, Akira; and Teramoto, Katsumi, 4,985,822, Cl. 364-142.000.

Teranishi, Teruo: *See*—
Takahashi, Kunimasa; Kameda, Takashi; Yoshikawa, Masato; and Teranishi, Teruo, 4,985,184, Cl. 264-6.000.

Terao, Naoyoshi: *See*—
Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, 4,985,623, Cl. 250-231.160.

Terao, Shinji; and Nishikawa, Kohei, to Takeda Chemical Industries, Ltd. Certain benzoquinones, naphthoquinones and derivatives thereof which exhibit thromboxane A_2 synthetase inhibition or receptor antagonism and the like. 4,985,447, Cl. 514-333.000.

Terumo Kabushiki Kaisha: *See*—
Kasai, Masaaki; Yamazaki, Sakae; and Miyake, Sanae, 4,985,026, Cl. 604-403.000.

Terwel, Roelof, to 501 Sallmetall BV. Method and device for cutting a sandwich panel. 4,984,615, Cl. 144-367.000.

Tetard, Serge: *See*—
de Goys de Mezeyrac, Charles; Fugier, Roger; Giquel, Bernard; and Tetard, Serge, 4,985,482, Cl. 524-215.000.

Texaco Inc.: *See*—
Pasternak, Mordechai, 4,985,138, Cl. 208-308.000.
Sung, Rodney L.; and Daly, Daniel T., 4,985,047, Cl. 44-433.000.

Texas Instruments Deutschland GmbH: *See*—
Vorel, Anton, 4,985,820, Cl. 363-49.000.

Texas Instruments Incorporated: *See*—
Houston, Theodore W., 4,985,865, Cl. 365-194.000.
Norwood, David A.; Manns, Willims G.; and Wood, Anthony B., 4,985,927, Cl. 382-8.000.
Spratt, David B.; Virkus, Robert L.; Eklund, Robert H.; and Zorinsky, Eldon J., 4,985,744, Cl. 357-43.000.
Thatte, Satish M.; and Oxley, Donald W., 4,985,829, Cl. 364-200.000.

Tharman, Paul A., to Briggs & Stratton Corporation. Oil pressure interlock switch powered by the engine starter. 4,984,543, Cl. 123-179.00A.

Thatte, Satish M.; and Oxley, Donald W., to Texas Instruments Incorporated. Cache hierarchy design for use in a memory management unit. 4,985,829, Cl. 364-200.000.

Theeuwes, Felix; and Yum, Su I., to ALZA Corporation. Intravenous system for delivering a beneficial agent. 4,985,016, Cl. 604-85.000.

Theeuwes, Felix, to ALZA Corporation. Parenteral therapeutical system comprising drug cell. 4,985,017, Cl. 604-92.000.

Themmler, Ursus: *See*—
Staendeke, Horst; and Themmler, Ursus, 4,985,221, Cl. 423-265.000.

Then Maschinen- und Apparatebau GmbH: *See*—
Christ, Wilhelm, 4,984,317, Cl. 8-149.100.

Theodoridis, George, to FMC Corporation. Tetrazolinone herbicides. 4,985,065, Cl. 71-92.000.

Thermal Ceramics, Inc.: *See*—
Sauder, Robert A., 4,984,405, Cl. 52-506.000.

Thermal Waste Management: *See*—
Lane, George M., 4,985,131, Cl. 208-13.000.

Thioux, Alain; and Levrai, Roland, to Bendix Europe Services Techniques. Braking corrector governed by the height of a vehicle. 4,984,853, Cl. 303-22.800.

Thomas, Alan D.; and Kalami, Hoshmand, to First Inertia Switch Limited. Acceleration responsive circuit for actuantinc vehicle equipment. 4,984,464, Cl. 73-517.00R.

Thomas, Orrett. Toilet sanitizer attachment. 4,984,307, Cl. 4-225.000.

Thomeer, Bart: *See*—
Sampa, Augdon; and Thomeer, Bart, 4,984,632, Cl. 166-237.000.

Thompson, George A. Rotary pump with cutting means. 4,984,975, Cl. 418-181.000.

Thompson, Jay A.: *See*—
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,985,848, Cl. 364-518.000.

Thomson Composants Microondes: *See*—
Mizuhara, Noboru; and Kuroyanagi, Kansuke, 4,985,887, Cl. 370-58.200.

Thomson-CSF: *See*—
Arques, Marc, 4,985,619, Cl. 250-208.100.
Tikes, Jacques; Le Fur, Joel; and Nugues, Pierre, 4,985,659, Cl. 315-3.500.
Vieux, Gerard; and de Croot, Paul, 4,985,633, Cl. 250-486.100.

Thorne, Jonathan O.; and Crowley, Christopher T., to BOC Group, Inc., The. Liquid/gas separation device. 4,985,055, Cl. 55-189.000.

Three Bond Co., Ltd.: *See*—
Mochizuki, Shuji; Okuma, Atsushi; and Haruna, Katsunori, 4,985,523, Cl. 526-301.000.

Tijburg, Rudolf P.: *See*—
Ponjee, Johannes J.; and Tijburg, Rudolf P., 4,985,370, Cl. 437-129.000.

Tikes, Jacques; Le Fur, Joel; and Nugues, Pierre, to Thomson-CSF. Travelling wave tube provided with an impervious coupling device between its delay line and an external microwave circuit. 4,985,659, Cl. 315-3.500.

Tioxide Group: *See*—
Chip, Gerald K.; and Rudin, Alfred, 4,985,469, Cl. 521-64.000.

Tip Computers International: *See*—
Fowler, Eugene C., 4,984,825, Cl. 283-98.000.

Tison, Allan J.: *See*—
Zion, Kenneth J.; and Tison, Allan J., 4,984,734, Cl. 229-109.000.

Titus Tool Company Limited: *See*—
Harley, David N., 4,984,926, Cl. 403-8.000.

Titze, James R.: *See*—
Braun, Stephen A.; O'Neill, Michael J.; Curry, Roger W.; Titze, James R.; Niosi, Donald E.; Fujikawa, Tetsuzo; Hirata, Makizo; and Nishimura, Michio, 4,984,417, Cl. 56-11.300.
Tjaden, Harold M. Coupling device. 4,984,667, Cl. 192-56.00R.
Tjutkin, Vladimir A.: *See*—
Odnoral, Alexandr P.; Tolmachev, Nikolai S.; and Tjutkin, Vladimir A., 4,985,735, Cl. 335-299.000.
TOA Medical Electronics Co., Ltd.: *See*—
Kuroda, Tomoyuki; and Fukuhara, Takahito, 4,985,174, Cl. 252-408.100.
Tobe, Akihiro: *See*—
Morita, Shuji; Saito, Ken-Ichi; Ninomiya, Kunihiro; Tobe, Akihiro; Nitta, Issei; and Sugano, Mamoru, 4,985,430, Cl. 514-253.000.
Tobias, Reginald, to IMO Industries, Inc. Two-dimensional spectrometer. 4,984,888, Cl. 356-328.000.
Toczyski, Zygmunt; Kruczynski, Stanislaw W.; Frackiewicz, Henryk; Lozinski, Janusz; Chlopek, Zdzislaw; Danilczyk, Wiktor; Ranachowski, Jerzy; Janula, Janusz; and Wolski, Lech, to Polska Akademia Nauk Instytut Podstawowych Problemow Techniki; and Politechnikawarszawski. Method and a device for feeding of spark ignition engines with a fuel medium. 4,984,550, Cl. 123-478.000.
Togai, Kazuhide; and Shimada, Makoto, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Traction control apparatus. 4,985,837, Cl. 364-426.020.
Togane, Hikohiro, to Mitsubishi Denki Kabushiki Kaisha. Low-loss oxide magnetic material. 4,985,167, Cl. 252-62.580.
Togoshi, Yoshikazu: *See*—
Samejima, Kazuo; Kawakita, Hiroaki; Togoshi, Yoshikazu; Matsuda, Yoshiaki; Sakatsuji, Takao; and Fulford, Colin, 4,984,420, Cl. 56-203.000.
Tohzuka, Takashi; Kataoka, Yoshiaki; Ishikawa, Sueyoshi; and Fujiwara, Koji, to Daikin Industries Ltd. Fluorine-containing grease and its preparation. 4,985,161, Cl. 252-54.000.
Tojo, Toru; Kuwabara, Osamu; Kamiya, Masashi; and Yoshino, Hisakazu, to Kabushiki Kaisha Toshiba; and Tokyo Kogaku Kikai Kabushiki Kaisha. Method and an apparatus for aligning first and second objects with each other. 4,984,890, Cl. 356-356.000.
Tokai Metals Co., Ltd.: *See*—
Matsumoto, Takeshi; Suzuki, Yuji; Kumagai, Masahiro; and Uchibori, Shinya, 4,985,288, Cl. 428-40.000.
Tokai Rubber Industries, Ltd.: *See*—
Nishimura, Kazuhiko, 4,984,604, Cl. 138-126.000.
Toki, Tadaaki: *See*—
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, 4,985,449, Cl. 514-349.000.
Tokiwa Chemical Industries Co., Ltd.: *See*—
Miyakawa, Naohisa; and Kato, Katuhisa, 4,984,839, Cl. 296-93.000.
Tokuda, Mitsuo: *See*—
Otsubo, Toru; Tokuda, Mitsuo; Yamaguchi, Yasuhiro; Sasaki, Ichirou; Ohara, Kazuhiro; Usuami, Hirohisa; and Azuma, Junzou, 4,985,109, Cl. 156-345.000.
Tokuda, Shuichiro: *See*—
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,984,859, Cl. 350-96.240.
Tokuhara, Masaharu: *See*—
Motoe, Hisafumi; Tokuhara, Masaharu; and Hoshino, Takaya, 4,985,701, Cl. 341-61.000.
Tokunaga, Yukio; Kaku, Koichiro; Kojima, Yoshiyuki; Maeno, Shinichiro; Sawai, Nobumitsu; and Saso, Yasuo, to Kumiai Chemical Industry Co., Ltd.; and Ihara Chemical Industry Co., Ltd. 5H-1,3,4-thiadiazolo(3,2-A)pyrimidin-5-one derivatives and agricultural-horticultural fungicide composition containing the same. 4,985,432, Cl. 514-258.000.
Tokura, Norihito; Ito, Hiroyasu; and Okabe, Naoto, to Nippondenso Co., Ltd. Insulated gate bipolar transistor. 4,985,743, Cl. 357-39.000.
Tokushima, Tadao: *See*—
Morizane, Toshinori; and Tokushima, Tadao, 4,985,306, Cl. 428-410.000.
Tokutake, Nobuo; Takahashi, Koichi; Satoh, Yoshiyuki; Kohara, Hidekatsu; and Nakayama, Toshimasa, to Tokyo Ohka Kogyo Co., Ltd. Positive-working photosensitive composition with three difference 1,2-naphthoquinone diazide sulfonic acid esters to include the ester of curcumin. 4,985,333, Cl. 430-192.000.
Tokuya, Tomohiko: *See*—
Saigo, Takeshi; Tokuya, Tomohiko; Kamimura, Haruo; Hori, Mitsuaki; and Yasuoka, Hidenori, 4,984,829, Cl. 285-334.000.
Tokyo Automatic Machinery Works Ltd.: *See*—
Shigeta, Toshio; Kishi, Yoshio; Kohata, Toshihide; and Sakano, Makoto, 4,984,750, Cl. 242-58.100.
Tokyo Eizai Laboratory Co., Ltd.: *See*—
Sekine, Takayuki; and Takekawa, Naomitsu, 4,984,566, Cl. 128-90.000.
Tokyo Electric Co., Ltd.: *See*—
Kikuchi, Shiego; and Nakamura, Shinya, 4,985,787, Cl. 360-78.020.
Nakayama, Tetsuro, 4,984,911, Cl. 400-124.000.
Tashiro, Takeshi; and Sugiura, Ikuzo, 4,984,915, Cl. 400-613.000.
Tokyo Electron Limited: *See*—
Karasawa, Wataru, 4,985,676, Cl. 324-158.00R.
Narita, Tomonori, 4,985,372, Cl. 437-192.000.
Ushijima, Mitsuru; and Akimoto, Masami, 4,985,722, Cl. 354-319.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Tojo, Toru; Kuwabara, Osamu; Kamiya, Masashi; and Yoshino, Hisakazu, 4,984,890, Cl. 356-356.000.
Tokyo Ohka Kogyo Co., Ltd.: *See*—
Tokutake, Nobuo; Takahashi, Koichi; Satoh, Yoshiyuki; Kohara, Hidekatsu; and Nakayama, Toshimasa, 4,985,333, Cl. 430-192.000.
Tokyo Seimitsu Co., Ltd.: *See*—
Horie, Hajime, 4,985,673, Cl. 324-158.00R.
Tolmachev, Nikolai S.: *See*—
Odnoral, Alexandr P.; Tolmachev, Nikolai S.; and Tjutkin, Vladimir A., 4,985,735, Cl. 335-299.000.
Tomi, Isao: *See*—
Obitsu, Masamichi; Tomi, Isao; and Kaga, Takao, 4,985,229, Cl. 423-608.000.
Tomimura, Toshio: *See*—
Okonogi, Shigeo; Tomita, Mamoru; Shimamura, Seiichi; Tomimura, Toshio; Ishibashi, Norio; Miyakawa, Hiroshi; and Sugawara, Koichi, 4,985,246, Cl. 424-115.000.
Tomisawa, Masao: *See*—
Morishita, Hiroaki; Aramaki, Jun; and Tomisawa, Masao, 4,985,608, Cl. 219-69.120.
Tomita, Mamoru: *See*—
Okonogi, Shigeo; Tomita, Mamoru; Shimamura, Seiichi; Tomimura, Toshio; Ishibashi, Norio; Miyakawa, Hiroshi; and Sugawara, Koichi, 4,985,246, Cl. 424-115.000.
Tomita, Yukihiro: *See*—
Ohshima, Yoshio; Watanabe, Tsunekazu; Watanabe, Keizaburo; Nonoyama, Noboru; Kitazume, Masayoshi; and Tomita, Yukihiro, 4,985,149, Cl. 210-603.000.
Tomitaka, Kichinojo: *See*—
Utsumi, Shigeo; Kotani, Tomoyuki; and Tomitaka, Kichinojo, 4,985,537, Cl. 528-272.000.
Tomosue, Takao: *See*—
Moriizumi, Shuichi; Masuhara, Kenichi; Yamabe, Hidetoshi; Tomosue, Takao; Mori, Kouji; and Kaneko, Hisaharu, 4,985,104, Cl. 156-244.110.
Tone, Shoichi: *See*—
Matsui, Isamu; and Tone, Shoichi, 4,984,749, Cl. 242-35.50R.
Tonen Corporation: *See*—
Murakami, Shinkichi; Watanabe, Osamu; Wada, Sadahisa; and Inoue, Hiroshi, 4,985,530, Cl. 528-103.000.
Toonen, James E.: *See*—
Lee, Nicholas A.; and Toonen, James E., 4,984,865, Cl. 350-96.200.
Toray Silicone Company, Ltd.: *See*—
Muramoto, Naohiro; and Mine, Katsutoshi, 4,985,342, Cl. 430-280.000.
Saito, Masayuki; Yoshida, Keiji; and Hamada, Mitsuo, 4,985,483, Cl. 524-265.000.
Shimizu, Koji; and Hamada, Mitsuo, 4,985,277, Cl. 427-180.000.
Torchia, Stephen F.: *See*—
Reed, Herbert M.; Sager, Scott J.; Grebenyuk, Alexander; and Torchia, Stephen F., 4,984,352, Cl. 29-568.000.
Torisu, Yoko: *See*—
Kishino, Hiroko; Matsuo, Noritada; Takagaki, Tohei; Tsushima, Kazunori; Yano, Toshihiko; and Torisu, Yoko, 4,985,457, Cl. 514-531.000.
Tornatore, Massimo: *See*—
Fornasier, Roberto; Tornatore, Massimo; and Chapoy, Larry L., 4,985,539, Cl. 528-423.000.
Torre, Randall J. Removable handle for bladed surgical instruments. 4,985,035, Cl. 606-167.000.
Torrence, Robert J.: *See*—
Glennon, Thomas F.; and Torrence, Robert J., 4,984,735, Cl. 236-92.00B.
Torres, Ghislaine: *See*—
Leising, Frederic; and Torres, Ghislaine, 4,985,166, Cl. 252-62.540.
Tosaka, Masaki; Kawano, Haruki; and Deguchi, Katsuhiko, to Kao Corporation. Containing a succinic acid derivative. 4,985,177, Cl. 252-547.000.
Toshiba Ceramics Co., Ltd.: *See*—
Imai, Isao; Ishii, Toshitsugu; and Sueyoshi, Kouichi, 4,985,224, Cl. 423-344.000.
Toshiba Silicone Co. Ltd.: *See*—
Kurita, Akitsugu; Takezawa, Yoshiaki; Saitoh, Nobuhiro; Shimada, Takehisa; and Takemoto, Hideaki, 4,985,286, Cl. 428-34.700.
Toshiba Tungaloy Co., Ltd.: *See*—
Kitamura, Kozo; Saitoh, Takeshi; Ueki, Mitsuo; and Kobori, Keiichi, 4,985,070, Cl. 75-238.000.
Tosoh Corporation: *See*—
Hayashi, Hidechika, 4,985,207, Cl. 422-102.000.
Toyo Jozo Kabushiki Kaisha: *See*—
Takahashi, Mamoru; Imamura, Shigeyuki; and Takada, Masaki, 4,985,360, Cl. 435-189.000.
Toyo Seikan Kaisha, Ltd.: *See*—
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Yomogida, Toshihiko; Uchida, Akira; Kobayashi, Goro; and Nakamura, Hisanori, 4,985,886, Cl. 370-1.000.
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Toyomaki, Yoshio; Nishikawa, Katsumi; and Kawakubo, Hitoshi, to Nippon Zoki Pharmaceutical Co., Ltd. Method of assaying kallikrein formation substances. 4,985,354, Cl. 435-13.000.
Toyomaki, Yoshio: *See*—
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Asada, Toshiyuki; Higashiyama, Yasuhiko; Nakawaki, Yasunori; Suzuki, Toshitake; Abe, Akiharu; and Moriguchi, Naoki, 4,985,011, Cl. 475-278.000.
Idogaki, Takaharu; Hayashi, Ikuo; Ishihara, Toshihisa; Inoue, Hideo; and Sugitani, Tatsuo, 4,984,463, Cl. 73-516.00R.
Kaede, Hiroshi; Koike, Tadahiro; Kato, Shinji; Maeda, Yorishige; Fuwa, Yoshio; Sugimoto, Shigetoshi; Aoyagi, Hikaru; and Shibata, Shinzi, 4,985,092, Cl. 148-326.000.
Kojima, Masahiro; Nishikawa, Seiichi; and Takahashi, Nobuaki, 4,984,485, Cl. 74-866.000.
Nishio, Takeyoshi; Yamauchi, Shinichi; Arashiro, Yusuke; Ohno, Kenyu; Yokoyama, Masuzo; Nakano, Hiroshi; Ohmori, Hiroshi; Mayumi, Junji; and Kihira, Michiharu, 4,985,495, Cl. 525-68.000.
Ogata, Kentarou; Kodama, Satoshi; and Murate, Masashi, 4,985,283, Cl. 427-424.000.
Takada, Mitsuru; Itoh, Hiroshi; and Takahashi, Tokuyuki, 4,984,486, Cl. 74-868.000.
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Yomogida, Toshihiko; Uchida, Akira; Kobayashi, Goro; and Nakamura, Hisanori, 4,985,886, Cl. 370-1.000.
Tozuka, Zenzaburo: *See*—
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Trager, Seymour F.; and Blackburn, G. Michael. Treatment of glaucoma. 4,985,417, Cl. 514-155.000.
Traut, Davis E., to United States of America, Interior. Induction slag reduction process for making titanium. 4,985,069, Cl. 75-10.180.
Trauth, Hubert: *See*—
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Trego, Brian R., to Dow Corning S.A. Preparation of modified polysiloxanes. 4,985,578, Cl. 556-457.000.
Tremblay, Marc: *See*—
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Tri-State Oil Tools, Inc.: *See*—
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Vadacchino, Joseph; and Herron, William L., 4,984,835, Cl. 292-341.160.
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Nagel, Thomas O., 4,984,356, Cl. 29-788.000.
Triquint Semiconductor, Inc.: *See*—
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Botez, Dan; Jansen, Michael; Mawst, Luke J.; Peterson, Gary L.; Simmons, William W.; Wilcox, Jaroslava Z.; and Yang, Jane J. J., 4,985,897, Cl. 372-50.000.
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Tsuboi, Yukitoshi; and Okamoto, Teiji, to Hitachi, Ltd. Image data transfer method and apparatus therefor. 4,985,784, Cl. 358-342.000.
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Tsuchiya, Sohji; Murakami, Mutsuaki; and Yoshimura, Susumu, to Matsushita Electric Industrial Co., Ltd. Photosensitive material for electrophotography and method for making same. 4,985,330, Cl. 430-130.000.
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Tsuruoka, Toshiaki; Nakamura, Masafumi; and Mori, Shintaro, to Matsushita Electric Industrial Co. Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Switching output circuit with high speed operation and low power consumption. 4,985,648, Cl. 307-456.000.
Tsuruoka, Tsutomu; Nakabayashi, Satoru; Fukuyasu, Harumi; Ishii, Yuuko; Tsuruoka, Takashi; Yamamoto, Haruo; Inouye, Shigeharu; and Kondo, Shinichi, to Meiji Seika Kaisha, Ltd. Cancer cell metastasis inhibitors and novel compounds. 4,985,445, Cl. 514-315.000.
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Yoshioka, Hirosuke; Obata, Tokio; Fujii, Katsutoshi; Tsutsumiuchi, Kiyoshi; and Yoshiya, Haruo, 4,985,426, Cl. 514-241.000.
Tsuyama, Chizuko. System for use in processing a speech by the use of stenographs. 4,985,929, Cl. 382-48.000.
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Tucker, Willy L.; and Arcoleo, Katherine M., to Icore International, Inc. Anti-decoupling device for electrical conduit connector. 4,984,995, Cl. 439-321.000.
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Turudic, Andy, to Northern Telecom Limited. Multi-layer tolerance checker. 4,985,675, Cl. 324-158.00R.
Tyebkhan, Yosufi M., to TRW Technar Inc. Rolamite sensor. 4,985,604, Cl. 200-503.000.
Tyers, Michael B., to Glaxo Group Limited. Medicaments. 4,985,437, Cl. 514-304.000.
Uarco Incorporated: *See*—
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Uchida, Hiroyasu; Abe, Tetsuaki; and Ishizawa, Hiroaki, to Hitachi, Ltd. Apparatus for maintaining liquid temperature at a constant level. 4,984,628, Cl. 165-26.000.
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Uchino, Shoichi; Ueno, Takumi; Iwayanagi, Takao; Nonogaki, Saburo; and Hashimoto, Michiaki, to Hitachi, Ltd. Radiation imaging process for forming pattern without alkali-soluble polymer underlayer and water soluble radiation-sensitive diazonium salt overlayer. 4,985,344, Cl. 430-325.000.
Uchiyama, Hiromitsu; Kawamoto, Masayuki; and Inada, Yoriko, to Toyota Jidosha Kabushiki Kaisha. Damping force control system for shock absorber variable with frequency of vehicle height difference exceeding limit value. 4,984,820, Cl. 280-707.000.
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, to Olympus Optical Co., Ltd. Therapeutical apparatus of extracorporeal type. 4,984,575, Cl. 128-660.030.
Udipi, Kishore, to Monsanto Company. Polyblends of thermoplastic copolyesters and styrenic/unsaturated dicarboxylic acid anhydride copolymers. 4,985,501, Cl. 525-173.000.
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Ueno, Katsunori; Aiga, Masayuki; and Kuroda, Masafumi, to Sanyo Electric Co., Ltd. High voltage through type capacitor and manufacturing method therefor. 4,985,802, Cl. 361-302.000.
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Ueno, Toyoaki, to UBE Industries, Ltd. Mold clamping apparatus for molding machine. 4,984,980, Cl. 425-595.000.
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Uffenheimer, Kenneth F.; Di Domenico, Nicholas F.; and Weitz, Stephen L., to Tritech Partners. Ultra low carryover sample liquid analysis apparatus and method. 4,984,475, Cl. 73-864.220.
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Haghiri, Mohammad R.; Guntzburger, Philippe; and Le Queau, Marcel, 4,985,767, Cl. 358-133.000.
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Goldberg, Eugene P.; Li, Fu-Mian; and Luo, Ching-Wang, 4,985,559, Cl. 544-34.000.
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Sugimori, Yoshio; Kimata, Yoshihide; Kurosaki, Tadao; and Urano, Joji, 4,985,771, Cl. 358-160.000.

Urano, Toshiyuki: *See—*
Sasa, Nobumasa; Shimizu, Kunio; Watanabe, Manabu; Urano, Toshiyuki; Mayama, Shinya; and Masuda, Tetsuya, 4,985,337, Cl. 430-254.000.

Urbanek, Edward A., Jr.: *See—*
Rische, Kenneth L.; Affeldt, Roger D.; and Urbanek, Edward A., Jr., 4,984,542, Cl. 123-179.00G.

Urbom, Deron L. Vehicular holster mount apparatus. 4,984,725, Cl. 224-311.000.

Ushijima, Mitsuru; and Akimoto, Masami, to Tokyo Electron Limited; and Tel Kyushu Limited. Apparatus for coating a photo-resist film and/or developing it after being exposed. 4,985,722, Cl. 354-319.000.

Ushio Denki Kabushiki Kaisha: *See—*
Takemura, Tetsu; Ichinose, Hidetoshi; Ohkubo, Keisuke; Sugitani, Akihiko; and Okamoto, Toshiyuki, 4,985,275, Cl. 427-106.000.

Usuami, Hirohisa: *See—*
Otsubo, Toru; Tokuda, Mitsuo; Yamaguchi, Yasuhiro; Sasaki, Ichirou; Ohara, Kazuhiro; Usuami, Hirohisa; and Azuma, Junzou, 4,985,109, Cl. 156-345.000.

Usui, Toshinao: *See—*
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,573, Cl. 549-402.000.
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,574, Cl. 549-402.000.

Utsumi, Shigeo; Kotani, Tomoyuki; and Tomitaka, Kichinojo, to Diafoil Company, Limited. Process of making a biaxially stretched polyester film and biaxially stretched polyester film. 4,985,537, Cl. 528-272.000.

Utsumi, Shigeo: *See—*
Fukuda, Yujiro; and Utsumi, Shigeo, 4,985,538, Cl. 528-305.000.

Utunomiya, Jiro; Iida, Saburo; Sibuya, Hitosi; Kusaba, Kazunori; and Narumi, Isao, to Oki Electric Industry Co., Ltd. Terminal structure and process of fabricating the same. 4,985,747, Cl. 357-68.000.

Uwabata, Hideyo: *See—*
Yasumoto, Yoshio; Kageyama, Sadashi; Inoue, Shuji; Abe, Yoshio; and Uwabata, Hideyo, 4,985,769, Cl. 358-141.000.

Uzuka, Makoto: *See—*
Chiba, Tadahiro; Miyazawa, Kiyoshi; Uzuka, Makoto; and Suzuki, Takashi, 4,985,425, Cl. 514-222.200.

Vadacchino, Joseph; and Herron, William L., to Trine Products Corp. Strike with rectilinearly movable keeper locking member. 4,984,835, Cl. 292-341.160.

Vail, Lawrence D.: *See—*
Lok, Brent M. T.; Marcus, Bonita K.; Vail, Lawrence D.; Flanigen, Edith M.; Patton, Robert L.; and Wilson, Stephen T., 4,985,151, Cl. 210-689.000.

Val Products, Inc.: *See—*
Steudler, Frederick W., Jr., 4,984,537, Cl. 119-72.500.

Valenzona, Joseph F., to Judco Manufacturing, Incorporated. Compact switching apparatus and method of construction. 4,985,605, Cl. 200-528.000.

Valmet-Ahlstrom, Inc.: *See—*
Kurki, Jarmo, 4,984,490, Cl. 83-13.000.

Valster, Karl C.; and Reicks, Allen V., to Precision Pulley, Inc. Method of making wing pulleys. 4,984,363, Cl. 129-892.100.

van der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely N.V. Mowing machine. 4,984,418, Cl. 56-13.600.

Van Der Schee, Gerrit L.: *See—*
Grootscholten, Paulus A. M.; and Van Der Schee, Gerrit L., 4,985,272, Cl. 426-609.000.

van der Werff, Jeichienus A.; and van Wijk, Robert, to Hadewe B.V. Method and an apparatus for folding paperlike material, such as documents, which may differ in quality and length and which are conveyed in assembled form or successively. 4,985,013, Cl. 493-444.000.

Vanderzanden, Eugene J.: *See—*
Graf, Peter E.; Agazzi, Steven J.; and Vanderzanden, Eugene J., 4,985,079, Cl. 106-502.000.

Van de Sande, Christian C.: *See—*
Vanmaele, Luc J.; and Van de Sande, Christian C., 4,985,395, Cl. 503-227.000.

Van De Walker, Ray G.: *See—*
Silverman, Stanley; Konechy, Kenneth A.; Van De Walker, Ray G.; and Newman, Richard S., 4,984,913, Cl. 400-249.000.

Van Dijken, Marten C.: *See—*
Prinsloo, Willem J. C.; De Villiers, Pierre; and Van Dijken, Marten C., 4,985,058, Cl. 55-457.000.

Van Leeuwen, Jacob K. L., to LTC International B.V. Abrasive blasting apparatus. 4,984,397, Cl. 51-425.000.

van Lengerich, Bernhard H., to Nabisco Brands, Inc. Extruder apparatus for producing an at least partially baked product having a cookie-like crumb structure including a post extrusion microwave device. 4,984,514, Cl. 99-353.000.

Vanmaele, Luc J.; and Van de Sande, Christian C., to Agfa-Gevaert, N.V. Dye-donor element for thermal dye sublimation transfer. 4,985,395, Cl. 503-227.000.

Vanovsek, Wolfgang: *See—*
Stadlbauer, Wilhelm, deceased; Koch, Erwin; Zauner, Franz; Rinesch, Rudolf; and Vanovsek, Wolfgang, 4,985,067, Cl. 75-10.100.

Van Perlstein, Erik B.; and den Hartog, Huibert W., to Hoogovens Groep B.V. Non-ageing low-alloy hot-rolled strip-form formable steel. 4,985,090, Cl. 148-320.000.

Van Randen, Age: *See—*
Habraken, Nicolaas J.; Van Randen, Age; De Vries, Franciscus; and De Jong, Fokke M., 4,984,408, Cl. 52-741.000.

Van Reenen, Albert J.: *See—*
Sanderson, Ronald D.; Dowler, Norman A.; and Van Reenen, Albert J., 4,985,145, Cl. 210-321.750.

van Stuivenberg, Herman H.: *See—*
den Hartog, Jacobus A. J.; van Stuivenberg, Herman H.; and van Wijngaarden, Ineke, 4,985,423, Cl. 514-219.000.

van Wijk, Robert: *See—*
van der Werff, Jeichienus A.; and van Wijk, Robert, 4,985,013, Cl. 493-444.000.

van Wijngaarden, Ineke; Hamminga, Derk; Haeck, Hans H.; and Wouters, Wouter, to Duphar International Research B.V. Certain substituted 1,7-annelated 1h-indazoles being selective antagonists of 5-ht-receptors. 4,985,424, Cl. 514-220.000.

van Wijngaarden, Ineke: *See—*
den Hartog, Jacobus A. J.; van Stuivenberg, Herman H.; and van Wijngaarden, Ineke, 4,985,423, Cl. 514-219.000.
Hamminga, Derk; Haeck, Hans H.; Van Wijngaarden, Ineke; and Wouters, Wouter, 4,985,420, Cl. 514-211.000.

Van Zyl, Brian R.: *See—*
Mazzullo, Raymond; and Van Zyl, Brian R., 4,985,806, Cl. 361-392.000.

Vaqua Limited: *See—*
Spencer, Colin W., 4,985,122, Cl. 203-11.000.

Vartuli, James: *See—*
Chu, Pochen; Herbst, Joseph A.; Klocke, Donald J.; and Vartuli, James, 4,985,223, Cl. 423-328.000.

Vasatis, Ioannis P.: *See—*
Chang, Keh-Minn; and Vasatis, Ioannis P., 4,985,201, Cl. 420-109.000.

Vaughan, Daniel J. Electrodialytic conversion of multivalent metal salts using sulfonate ions. 4,985,127, Cl. 204-182.400.

Vazquez, Rafael. Global clock apparatus. 4,985,876, Cl. 368-23.000.

VEB Kombinat Medizinund Labortechnik Leipzig: *See—*
Scholz, Ralph-Peter; and Glockner, Volker, 4,985,280, Cl. 427-244.000.

Velcro Industries B.V.: *See—*
Provost, George A.; and Rocha, Gerald F., 4,984,339, Cl. 24-452.000.

Vennootschap onder firma: ALVA: *See—*
Breider, Jacob; and Arends, Arend; R., 4,985,692, Cl. 340-407.000.

Verde, Giancarlo U. Hemorrhoidal treatment and composition. 4,985,257, Cl. 424-705.000.

Vermont American Corporation: *See—*
Pennington, Donald C., Jr.; and Knox, John D., 4,984,944, Cl. 408-223.000.

Verot, Yvan: *See—*
Masini, Jean-Jacques; and Verot, Yvan, 4,985,214, Cl. 422-188.000.

Verweij, Jan; De Koning, Jan J.; and Witkamp, Hendrik A., to Gist-Brocades N.V. Process for the preparation of 3-exomethylene cepham derivatives. 4,985,554, Cl. 540-215.000.

Vezer, Szilard: *See—*
Kreidl, Janos; Turcsanyi, Peter; Arcs nee Trischler, Zsuzsanna; Stefko, Bela; Meszaros nee Brill, Judit M.; Deutsch nee Juhasz, Ida; Szilbereky, Jeno ; Csizer, Eva; and Vezer, Szilard, 4,985,463, Cl. 514-646.000.

Vezzoli, Annibale: *See—*
Addeo, Antonio; Bonvini, Alberto; Reggiani, Romano; and Vezzoli, Annibale, 4,985,303, Cl. 428-36.500.

Vick, Gerald L., to Rockwell International Corporation. Wide viewing angle avionics liquid crystal display. 4,984,872, Cl. 350-321.000.

Victor Company of Japan, Ltd.: *See—*
Nishimura, Shigehiro, 4,984,753, Cl. 242-199.000.
Sugiyama, Kenji, 4,985,768, Cl. 358-136.000.

Videocolor: *See—*
Canevazzi, Giuliano, 4,985,658, Cl. 313-477.00R.

Vieux, Gerard; and de Croot, Paul, to Thomson-CSF. Scintillator with alveolate structured substrate. 4,985,633, Cl. 250-486.100.

Villa, Ezio; Biazzi, Giuseppe; and Guelfi, Giorgio, to Alfa Lancia S.p.A. Automobile seal and trimming gasket. 4,984,843, Cl. 296-213.000.

Vinden, Jonathan: *See—*
Benoit, Dominque; and Vinden, Jonathan, 4,984,389, Cl. 49-502.000.
Brault, Richard; Croteau, Dianne; and Vinden, Jonathan, 4,984,987, Cl. 434-265.000.

Vinegar, Harold J.; and Stegemeier, George L., to Shell Oil Company. Vacuum method for removing soil contamination utilizing surface electrical heating. 4,984,594, Cl. 134-21.000.

Vinson, Kenneth D.; and Huff, Byron J. L., to Procter & Gamble Cellulose Company, The. Cellulose fiber-reinforced structure. 4,985,119, Cl. 162-149.000.

Virkus, Robert L.: *See—*
Spratt, David B.; Virkus, Robert L.; Eklund, Robert H.; and Zorinsky, Eldon J., 4,985,744, Cl. 357-43.000.

Visconti, Marco, to Alfa Lancia S.p.A. Steering device for a motor vehicle with four steered wheels. 4,984,815, Cl. 280-91.000.

Vishoot, Mimi: *See—*
Faulds, Daryl H.; and Vishoot, Mimi, 4,985,243, Cl. 424-85.800.

Visual Information Technologies, Inc.: *See—*
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,985,848, Cl. 364-518.000.

Vlach, Martin. Mixed-mode-simulator interface. 4,985,860, Cl. 364-578.000.

VLSI Technology, Inc.: *See—*
Halbert, John B., III, 4,985,872, Cl. 365-230.090.
Price, Jack A., 4,985,864, Cl. 365-189.060.

Vohnout, Vincent J. Apparatus and method for training oarsmen. 4,984,986, Cl. 434-247.000.

Voirin, Guy: *See—*
Parriaux, Olivier; Neuman, Victor; and Voirin, Guy, 4,984,863, Cl. 350-96.110.

Voith, Donald J.; Paegelow, David G.; and Jagodzinski, John E., to Water Services of America, Inc. Ball collector and filling apparatus for circulating ball cleaning system. 4,984,629, Cl. 165-95.000.

Von Moose Stahl AG: *See—*
Balzli, Samuel; and Syfrig, Werner, 4,984,770, Cl. 266-106.000.

Von Der Saal, Wolfgang: *See—*
Zilch, Harald; Mertens, Alfred; Von Der Saal, Wolfgang; Boehm, Erwin; and Strein, Klaus, 4,985,448, Cl. 514-339.000.

Von Stoutenborough, Eric; and Lang, David J., to Sundstrand Corporation. Torque monitor. 4,984,473, Cl. 73-862.190.

Vorel, Anton, to Texas Instruments Deutschland GmbH. Driver circuit for switching on lamp with low cold resistance. 4,985,820, Cl. 363-49.000.

Vorhauer, Rodney R. Axle wedge removal tool assembly. 4,984,346, Cl. 29-277.000.

W. L. Gore & Associates, Inc.: *See—*
Mortimer, William P., Jr., 4,985,296, Cl. 428-220.000.
Shibata, Yoshihiko; Chikamori, Yoshihiro; and Shimizu, Youichi, 4,985,054, Cl. 55-178.000.

W. R. Grace & Co-Conn.: *See—*
Gilson, Jean-Pierre, 4,985,384, Cl. 502-61.000.

W. R. Grace & Co.-Conn.: *See—*
Whittenberger, William A., 4,985,388, Cl. 502-439.000.

Wachtler, Andreas: *See—*
Eidenschink, Rudolf; Krause, Joachim; Wachtler, Andreas; Hittich, Reinhard; Scheuble, Bernhard; Weber, Georg; and Kurmeier, Hans-Adolf, 4,985,583, Cl. 558-431.000.

Wada, Nobuhide; Saito, Yoshihiro; Kusano, Shoji; Toyokawa, Yasuhumi; Miyazawa, Takeshige; Kajiwara, Ikuo; and Takahashi, Satoru, to Kumiai Chemical Industry Co., Ltd.; and Ihara Chemical Industry Co., Ltd. 2-phenoxypyrimidine derivative and herbicidal composition. 4,985,066, Cl. 71-92.000.

Wada, Sadahisa: *See—*
Murakami, Shinkichi; Watanabe, Osamu; Wada, Sadahisa; and Inoue, Hiroshi, 4,985,530, Cl. 528-103.000.

Wada, Yoshiaki; Itaba, Tunesaku; Kasahara, Koichiro; Mizuno, Tomokimi; and Momose, Yutaka, to Kabushiki Kaisha Riken; and Aisin Seiki Kabushiki Kaisha. Oil seal assembly. 4,984,812, Cl. 277-153.000.

Wada, Yoshio: *See—*
Hara, Kenji; and Wada, Yoshio, 4,985,685, Cl. 329-349.000.

Wade, Calvin N., to Steamatic, Inc. Duct sweeper. 4,984,329, Cl. 15-387.000.

Wagener, Kenneth B.; and Wanigatunga, Sirisoma, to University of Florida. Siloxane-polypivalolactone thermoplastic elastomers. 4,985,511, Cl. 525-474.000.

Wagner, Robert J.: *See—*
Gillan, Leland E.; and Wagner, Robert J., 4,984,640, Cl. 173-123.000.

Wakamatsu, Hiroyuki: *See—*
Watanabe, Hideo; Yamazaki, Hajime; and Wakamatsu, Hiroyuki, 4,985,294, Cl. 428-209.000.

Wakatsuki, Junya: *See—*
Matsunaga, Akira; Wakatsuki, Junya; Horinishi, Nobutaka; Imamura, Takashi; and Kurosaki, Tomihiro, 4,985,412, Cl. 514-70.000.

Wakazono, Kenji: *See—*
Matsushima, Jun; Kageyama, Tetsuto; Nakamura, Shigekazu; and Wakazono, Kenji, 4,984,474, Cl. 73-862.330.

Wakiyama, Kouji: *See—*
Arai, Kazuo; Ota, Kiyoshi; and Wakiyama, Kouji, 4,985,786, Cl. 360-70.000.

Walker, George P.: *See—*
Aronowitz, Sheldon; Forsythe, Donald D.; Walker, George P.; and Gadepally, Bhaskar V. S., 4,985,717, Cl. 357-23.500.

Walkowiak, Stefan: *See—*
Peelle, H. E., Jr.; Chang, I-Lin; and Walkowiak, Stefan, 4,984,658, Cl. 187-58.000.

Wallis, Christopher J.: *See—*
Waterhouse, Ian; Naylor, Alan; Wallis, Christopher J.; and Ellis, Frank, 4,985,427, Cl. 514-242.000.

Walsdorf, Neill B.; and Alexandrides, George, to Mission Pharmacal Company, Inc. Magnesium potassium citrate. 4,985,593, Cl. 562-584.000.

Walsh, John B., to Boeing Company, The. Intercept detector for spread-spectrum signals. 4,985,899, Cl. 375-1.000.

Walter, Alan E.: *See—*
McConnell, Christopher F.; and Walter, Alan E., 4,984,597, Cl. 134-95.000.

Walter, John: *See—*
Pfaffmann, George D.; Kubis, Charles S.; Currie, John P.; Balzer, Norbert R.; Walter, John; and Adams, Graham R., 4,984,414, Cl. 53-478.000.

Walter, Timothy H.; and Pontiff, Thomas M., to Du Pont de Nemours, E. I., and Company. Midsole for footwear. 4,984,376, Cl. 36-30.00R.

Wanamaker, Thomas. Blood drawing apparatus. 4,984,580, Cl. 128-763.000.

Wang, Chia-Lin J.; and Wuonola, Mark A., to Du Pont de Nemours, E. I., and Company. Aminomethyl oxooxazolidinyl cycloalkylbenzene derivatives useful as antibacterial agents. 4,985,429, Cl. 514-253.000.

Wang, Li: *See—*
Moser, Mark D.; Lawson, R. J.; Wang, Li; Parulekar, Vivekanand; Peer, Roger L.; and Hamlin, Charles R., 4,985,132, Cl. 208-65.000.

Wang, Teh-Chuan, to Du Pont de Nemours, E. I., and Company. Coated large diameter oriented monofilaments. 4,985,304, Cl. 428-373.000.

Wanigatunga, Sirisoma: *See—*
Wagener, Kenneth B.; and Wanigatunga, Sirisoma, 4,985,511, Cl. 525-474.000.

Wanke, Thomas S.: *See—*
Ottman, Rick; Wiberg, Don; Johnson, Jack; Wanke, Thomas S.; and Davis, Thomas W., 4,984,989, Cl. 434-401.000.

Wannlund, Jon C.; and Smith, Jerry W. Luminescence exposure apparatus. 4,985,631, Cl. 250-361.00R.

Ward, Bobby G.: *See—*
Duncan, Frank L.; Hughes, Donald W. K.; and Ward, Bobby G., 4,984,998, Cl. 439-352.000.

Ward, Robert L. Dynamically variable display and printer subsystem for use in sorting operations. 4,985,842, Cl. 364-478.000.

Ward, Terence J.: *See—*
Archibald, John L.; and Ward, Terence J., 4,985,438, Cl. 514-307.000.

Wardle, John W.: *See—*
Leeson, Plato J.; and Wardle, John W., 4,984,505, Cl. 91-361.000.

Warenback, Douglas H.; and Hoog, Josef T. Spatula for wafer transport. 4,984,954, Cl. 414-416.000.

Warman International Limited: *See—*
Grzina, Anthony, 4,984,966, Cl. 29-888.061.

Warner, Samuel R.: *See—*
Feller, Roger K.; Warner, Samuel R.; and Capriotti, Janice D., 4,984,454, Cl. 73-117.300.

Warrington, Jack E., to Green Cone Inc. Container for disposing waste. 4,984,561, Cl. 126-417.000.

Washam, Roy M.: *See—*
Waslo, Jennifer; Kuwata, Masayoshi; and Washam, Roy M., 4,984,429, Cl. 60-752.000.

Waslo, Jennifer; Kuwata, Masayoshi; and Washam, Roy M., to General Electric Company. Impingement cooled liner for dry low NOx venturi combustor. 4,984,429, Cl. 60-752.000.

Wasterlain, Michel: *See—*
Mertens, Guy; Reydams, Jean-Jacques; and Wasterlain, Michel, 4,985,099, Cl. 156-94.000.

Watakabe, Yaichiro; Okamoto, Tatsuo; and Matsuda, Shuichi, to Mitsubishi Denki Kabushiki Kaisha. Process for manufacturing a photomask. 4,985,319, Cl. 430-5.000.

Watanabe, Etsuo; and Hoshi, Masakazu, to Taiyo Fishery Co., Ltd. Method for detecting meat freshness using a biosensor. 4,985,125, Cl. 204-153.120.

Watanabe, Hideo; Yamazaki, Hajime; and Wakamatsu, Hiroyuki, to Yokohama Rubber Co., Ltd., The. Printed wiring board. 4,985,294, Cl. 428-209.000.

Watanabe, Hidetaka; and Fukunaga, Kanji, to Mitsubishi Denki Kabushiki kaisha. Disk shaped recording reproduction device. 4,985,884, Cl. 369-263.000.

Watanabe, Hirotoshi: *See—*
Iseki, Takeshi; Makino, Osamu; Ioka, Mitsuo; and Watanabe, Hirotoshi, 4,985,377, Cl. 501-51.000.

Watanabe, Katsuya: *See—*
Saito, Yasuhisa; Kanagawa, Shuichi; Watanabe, Katsuya; and Kamio, Kumimasa, 4,985,529, Cl. 528-96.000.

Watanabe, Keizaburo: *See—*
Ohshima, Yoshio; Watanabe, Tsunekazu; Watanabe, Keizaburo; Nonoyama, Noboru; Kitazume, Masayoshi; and Tomita, Yukihiro, 4,985,149, Cl. 210-603.000.

Watanabe, Manabu: *See*—
Sasa, Nobumasa; Shimizu, Kunio; Watanabe, Manabu; Urano, Toshiyuki; Mayama, Shinya; and Masuda, Tetsuya, 4,985,337, Cl. 430-254.000.

Watanabe, Nobuhiko: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 4,984,575, Cl. 128-660.030.

Watanabe, Norio: *See*—
Sawada, Michinori; Watanabe, Norio; and Endo, Yoshiaki, 4,984,345, Cl. 29-263.000.

Watanabe, Osamu: *See*—
Murakami, Shinkichi; Watanabe, Osamu; Wada, Sadahisa; and Inoue, Hiroshi, 4,985,530, Cl. 528-103.000.

Watanabe, Shizuharu; Tani, Hiroji; and Kasanami, Tohru, to Murata Manufacturing Co., Ltd. Resistive paste. 4,985,176, Cl. 252-521.000.

Watanabe, Takashi: *See*—
Takahashi, Takehiko; Saito, Hideo; Watanabe, Takashi; and Kaneko, Tomihioro, 4,984,813, Cl. 280-30.000.

Watanabe, Tetsumi: *See*—
Momose, Yutaka; Watanabe, Tetsumi; Hiraiwa, Kouzi; and Mizuno, Tomokimi, 4,984,428, Cl. 60-517.000.

Watanabe, Tetsuya; Sato, Yoshio; Nakamura, Tsutomu; Kumagai, Naoki; and Kamono, Takashi, to AMP Incorporated. Printed circuit board edge connector. 4,984,996, Cl. 439-326.000.

Watanabe, Tomoyoshi: *See*—
Ogawa, Fumihiko; Hori, Kazunobu; Asai, Keiichi; and Watanabe, Tomoyoshi, 4,984,842, Cl. 296-155.000.

Watanabe, Toshiharu, to Sakae Riken Kogyo Co., Ltd. Method of making a decorative object having a notch-cut back side. 4,985,194, Cl. 264-247.000.

Watanabe, Tsunekazu: *See*—
Ohshima, Yoshio; Watanabe, Tsunekazu; Watanabe, Keizaburo; Nonoyama, Noboru; Kitazume, Masayoshi; and Tomita, Yukihiro, 4,985,149, Cl. 210-603.000.

Wataya, Seiji: *See*—
Shimomura, Setsuhiro; Wataya, Seiji; Nishimura, Yukinobu; and Okubo, Satoru, 4,984,546, Cl. 123-425.000.

Water-Matic Corporation: *See*—
Weigert, Hans, 4,984,314, Cl. 4-663.000.

Water Research Commission: *See*—
Sanderson, Ronald D.; Dowler, Norman A.; and Van Reenen, Albert J., 4,985,145, Cl. 210-321.750.

Water Services of America, Inc.: *See*—
Voith, Donald J.; Paegelow, David G.; and Jagodzinski, John E., 4,984,629, Cl. 165-95.000.

Waterhouse, Ian; Naylor, Alan; Wallis, Christopher J.; and Ellis, Frank, to Glaxo Group Limited. Triazine derivatives. 4,985,427, Cl. 514-242.000.

Watkins, James W.; and Hicks, Darrell D. Reaction products of p-vinylphenol and polyisocyanates. 4,985,587, Cl. 560-25.000.

Weatherford U.S., Inc.: *See*—
Langer, Friedrich H.; and Woodward, Michael J., 4,984,633, Cl. 166-241.000.

Webasto AG Fahrzeugtechnik: *See*—
Bienert, Horst; and Bauer, Max, 4,984,332, Cl. 16-93.00R.

Webb, David A., Jr.; Fite, David B.; Hetherington, Ricky C.; McKeen, Francis X.; Firstenberg, Mark A.; Murray, John E.; Manley, Dwight P.; Salett, Ronald M.; and Fossum, Tryggve, to Digital Equipment Corporation. System for delaying processing of memory access exceptions until the execution stage of an instruction pipeline of a virtual memory system based digital computer. 4,985,825, Cl. 364-200.000.

Weber, Georg: *See*—
Eidenschink, Rudolf; Krause, Joachim; Wachtler, Andreas; Hittich, Reinhard; Scheuble, Bernhard; Weber, Georg; and Kurmeier, Hans-Adolf, 4,985,583, Cl. 558-431.000.

Weber, Wilhelm: *See*—
Endres, Robert; Weber, Wilhelm; and Preuss, Krystyna, 4,985,476, Cl. 523-210.000.

Webster, Nancy W.: *See*—
Moore, W. Gerald; and Webster, Nancy W., 4,984,606, Cl. 139-25.000.

Wegener Communications, Inc.: *See*—
Pelkey, Gary L., 4,985,895, Cl. 371-37.700.

Wehnert, Wolfgang: *See*—
Dziurla, Hans-Jurgen; Reinking, Klaus; Wehnert, Wolfgang; and Tresper, Erhard, 4,985,175, Cl. 252-506.000.

Weigert, Hans, to Water-Matic Corporation. Automatic fluid-flow control system. 4,984,314, Cl. 4-663.000.

Weiman, Novia A.: *See*—
Taylor, Joann M.; McManus, Paul A.; Murch, Gerald M.; Rochat, Roxanna F.; and Weiman, Novia A., 4,985,853, Cl. 364-521.000.

Weiner, Mark W. Aqua light. 4,985,811, Cl. 362-101.000.

Weinstein, Jack, to Primary Delivery Systems, Inc. Non-reversing tablet dispenser with counter. 4,984,709, Cl. 221-7.000.

Weissmuller, Joachim: *See*—
Kramer, Wolfgang; Weissmuller, Joachim; Berg, Dieter; Brandes, Wilhelm; and Dutzmann, Stefan, 4,985,421, Cl. 514-212.000.

Weitz, Stephen L.: *See*—
Uffenheimer, Kenneth F.; Di Domenico, Nicholas F.; and Weitz, Stephen L., 4,984,475, Cl. 73-864.220.

Wellcome Foundation Ltd., The: *See*—
Casida, John E.; and Elliott, Michael, 4,985,411, Cl. 514-63.000.
Larkin, John P., 4,985,582, Cl. 558-388.000.

Wellman, William E.: *See*—
Yezrielev, Albert I.; Romanelli, Michael G.; and Wellman, William E., 4,985,517, Cl. 526-208.000.

Wellner, Wolfgang: *See*—
Blum, Harald; Hohlein, Peter; Sonntag, Michael; and Wellner, Wolfgang, 4,985,506, Cl. 525-298.000.

Wells, Richard C., to Bidwell, Ralph, a part interest. Motor extension shaft removal tool. 4,984,344, Cl. 29-261.000.

Welt, Guenther: *See*—
Hilbig, Josef; Welt, Guenther; and Ziegelmayer, Manfred, 4,985,152, Cl. 210-771.000.

Wen-Don Corporation: *See*—
Cole, Robert, 4,985,162, Cl. 252-60.000.

Werner & Pfleiderer, GmbH: *See*—
Grimminger, Albert; Lauser, Wolfgang; Muller, Franz J.; Pfaff, Gerhard; and Schlipf, Edgar, 4,984,977, Cl. 425-145.000.

Westeppe, Uwe; Lindner, Christian; Piejko, Karl-Erwin; and Laue, Hans-Joachim, to Bayer Aktiengesellschaft. Reinforced/filled blends of thermoplastic interpolymers and polyamides and a process for their production. 4,985,486, Cl. 524-514.000.

Westeppe, Uwe: *See*—
Pakull, Ralf; Freitag, Dieter; Eckhardt, Volker; Idel, Karsten-Josef; and Westeppe, Uwe, 4,985,532, Cl. 528-190.000.
Wittmann, Dieter; Eckel, Thomas; Ott, Karl-Heinz; Damrath, Volker; and Westeppe, Uwe, 4,985,492, Cl. 525-63.000.

Westfelt, Jan A. N., to Aktiebolaget Electrolux. Operating device for a dish-washer. 4,984,596, Cl. 134-58.0DL.

Westlake, Anthony S.: *See*—
Bird, Derek G.; and Westlake, Anthony S., 4,984,374, Cl. 34-50.000.

Westlund, Arnold, Jr.; and Buschmann, Jeffrey P., to GTE Products Corporation. Lamp with re-enforced tubular base pins. 4,985,656, Cl. 313-318.000.

Whaley, Edward L.: *See*—
Neilson, Diane H. R.; Work, Sara L. R.; Whaley, Edward L.; Kirkpatrick, Steven J.; and McCarthy, James P., 4,985,271, Cl. 426-595.000.

Wheatland, Graham, to 501 Manaras Auto Doors, Inc. Door drive mechanism adapter unit. 4,984,387, Cl. 49-362.000.

Wheland, Robert C.: *See*—
Anderson, Albert G.; Hertler, Walter R.; Wheland, Robert C.; and Chen, Yuan Yu G., 4,985,332, Cl. 430-176.000.

Whelen Technologies, Inc.: *See*—
Lyons, Harold W., 4,985,814, Cl. 362-240.000.

Whistler, Roy L., to Lafayette Applied Chemistry, Inc. Microporous granular starch matrix compositions. 4,985,082, Cl. 127-33.000.

White, Edward C.; Blake, Douglas T.; and Grassel, Michael C., to United States Surgical Corporation. Apparatus for forming a suture cut-off feature in a surgical needle possessing a suture-receiving socket. 4,984,941, Cl. 408-104.000.

White, John A., Jr. Vehicle and powertrain therefor for use by children. 4,984,645, Cl. 180-65.600.

White, Judith E., to Allyssa Industries, Inc. Pet cage. 4,984,535, Cl. 119-17.000.

White, William C.: *See*—
Blank, Lynne M. B.; Boyce, Thomas D.; and White, William C., 4,985,023, Cl. 604-360.000.

Whitefield, John T.: *See*—
Beacham, Dwight A.; Woron, Robert P.; and Whitefield, John T., 4,984,496, Cl. 84-625.000.

Whittenberger, William A., to W. R. Grace & Co.-Conn. Catalytic exhaust pipe insert. 4,985,388, Cl. 502-439.000.

Wiberg, Don: *See*—
Ottman, Rick; Wiberg, Don; Johnson, Jack; Wanke, Thomas S.; and Davis, Thomas W., 4,984,989, Cl. 434-401.000.

Wieners, Gerhard: *See*—
Herbrechtsmeier, Peter; Wieners, Gerhard; Kuhls, Jurgen; Tschacher, Manfred; and Fitz, Herbert, 4,984,870, Cl. 350-96.340.

Wiklund, Ola: *See*—
Bjoerk, Erik; and Wiklund, Ola, 4,985,909, Cl. 378-173.000.

Wilcox, Jaroslava Z.: *See*—
Botez, Dan; Jansen, Michael; Mawst, Luke J.; Peterson, Gary L.; Simmons, William W.; Wilcox, Jaroslava Z.; and Yang, Jane J. J., 4,985,897, Cl. 372-50.000.

Wilcox, Reed: *See*—
Singer, Norman; Wilcox, Reed; Podolski, Joseph S.; Chang, Hsien-Hsin; Pookote, Suseelan; Dunn, John M.; and Hatchwell, Leora, 4,985,270, Cl. 426-515.000.

Wildevuur, Charles R. H.: *See*—
Lommen, Etienne J. C. M. P.; Wildevuur, Charles R. H.; and Hinrigs, Wouter L. J., 4,985,036, Cl. 623-15.000.

Wilen, Don J.; and Cooper, Frank, to Computer Instruments Corporation. Method for determining physical properties of liquids. 4,984,451, Cl. 73-53.000.

Wilhelm, Volker: *See*—
Rademachers, Jakob; Wilhelm, Volker; Keifer, Siegfried; and Burow, Wilfried, 4,985,078, Cl. 106-419.000.

Wilkes, Lambert H.; Mehner, Martin; and Lalor, William F., to Cotton Incorporated. Method and apparatus for removing a fiber fraction from seed cotton. 4,984,334, Cl. 19-48.00R.

Wilkinson, William T. Device for simulating climbing. 4,984,785, Cl. 272-70.000.

Wilkinson, William T.; and Bent, James E. Computer security device. 4,985,695, Cl. 340-571.000.

Willcocks, Martin E. G.; and McNair, Rhett, to McNair, Rhett. Low voltage lamp switcher circuit. 4,985,662, Cl. 315-90.000.

Williams, Alan; Wilson, John D.; Wragg, Roger D.; Jones, Stephen D.; Komodromos, Costa; and Reynolds, Timothy J., to British Gas plc. Method of preparing a catalyst precursor comprised of calcined nickel-aluminum feitknecht compound/non-calcined alumino-silicate clay/alkaline earth and/or rear earth metal compound. 4,985,385, Cl. 502-84.000.

Williams, Brian Howard; and Young, Chung-I, to Minnesota Mining and Manufacturing Company. Compositions for providing abherent coatings. 4,985,473, Cl. 522-89.000.

Williams International Corporation: *See*—
Cruzen, Gerald S., 4,984,967, Cl. 416-140.000.

Williams, Peter S.: *See*—
Kitson, Melanie; and Williams, Peter S., 4,985,572, Cl. 549-326.000.

Willis, Richard A.: *See*—
Springer, Jack F., Jr.; Smith, Timothy S.; Cloutier, Cathy A.; Marcantonio, Ben A.; and Willis, Richard A., 4,984,571, Cl. 128-371.000.

Wilson, David T.; Dionesotes, Neil T.; and Roman, Paul F., to Raytheon Company. Method of forming a molecularly polarized polmeric sheet into a non-planar shape. 4,985,195, Cl. 264-320.000.

Wilson, John D.: *See*—
Williams, Alan; Wilson, John D.; Wragg, Roger D.; Jones, Stephen D.; Komodromos, Costa; and Reynolds, Timothy J., 4,985,385, Cl. 502-84.000.

Wilson, Stephen T.: *See*—
Lok, Brent M. T.; Marcus, Bonita K.; Vail, Lawrence D.; Flanigen, Edith M.; Patton, Robert L.; and Wilson, Stephen T., 4,985,151, Cl. 210-689.000.

Wimmer, Eric P.; Lecolier, Serge L.; Ducrocq, Claire A.; Servy, Claudine G.; and Lenfant, Maryse T., to Societe Nationale des Poudres et Explosifs. Process for the synthesis of glyceryl monomitrates by bioconversion of nitroglycerine. 4,985,357, Cl. 435-128.000.

Windmoller & Holscher: *See*—
Brinkmeier, Friedhelm; and Rautenberg, Horst, 4,984,728, Cl. 226-172.000.

Wingen, Rainer; Dubal, Hans-Rolf; Hemmerling, Wolfgang; Muller, Ingrid; and Ohlendorf, Dieter, to Hoechst AG. Chiral aryloxypropionates, and the use thereof as dopes in liquid-crystal phases. 4,985,172, Cl. 252-299.670.

Winkler, Gernot: *See*—
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Winkler, Thomas: *See*—
Lewis, David F.; Schenfele, Robert D.; and Winkler, Thomas, 4,985,290, Cl. 428-76.000.

Winocur, Joseph. Translation insensitive keratometer using moire deflectometry. 4,984,883, Cl. 351-212.000.

Winquist, Knut L., to Association of American Railroads. Unit injector for staged injection. 4,984,738, Cl. 239-88.000.

Winters, Carey. Apparatus for controlling the speed and impression on a manual ink proofer. 4,984,532, Cl. 118-242.000.

Wintrich, Franz: *See*—
Mindermann, Kurt-Henry; and Wintrich, Franz, 4,984,524, Cl. 110-346.000.

Wirtz, Herbert; Feustel, Michael; and Balzer, Juliane, to Hoechst Aktiengesellschaft. Polymer mixtures for improving the low-temperature flow properties of mineral oil distillates. 4,985,048, Cl. 44-394.000.

Wissler, Richard: *See*—
Riedel, Wolfgang; Wissler, Richard; Fichter, Otmar; Gregorius, Klaus; Mattauch, Gerhard; and Schorner, Heinz, 4,985,805, Cl. 361-386.000.

Witkamp, Hendrik A.: *See*—
Verweij, Jan; De Koning, Jan J.; and Witkamp, Hendrik A., 4,985,554, Cl. 540-215.000.

Wittek, Jurgen: *See*—
Basse, Hartwig; and Wittek, Jurgen, 4,985,182, Cl. 261-94.000.

Wittenburg, Timothy M., to Honeywell Inc. Method for rapid generation of photo-realistic imagery. 4,985,854, Cl. 364-522.000.

Wittmann, Dieter; Eckel, Thomas; Ott, Karl-Heinz; Damrath, Volker; and Westeppe, Uwe, to Bayer Aktiengesellschaft. Polyphenylene ether molding compositions. 4,985,492, Cl. 525-63.000.

Wittmann, Dieter: *See*—
Eckel, Thomas; Wittmann, Dieter; Leitz, Edgar; Schoeps, Jochen; Ott, Karl-Heinz; and Peters, Horst, 4,985,493, Cl. 525-67.000.

Wittmann, Werner: *See*—
Gotz, Eckart; Lerch, Hans-Reter; Dorsam, Thomas; Schweigert, Gerhard; Wittmann, Werner; and Korner, Michael, 4,985,845, Cl. 364-492.000.

Wolff, Erich: *See*—
Matejec, Reinhart; Odenwalder, Heinrich; Ohlschlager, Hans; and Wolff, Erich, 4,985,351, Cl. 430-598.000.

Wolski, Lech: *See*—
Toczyski, Zygmunt; Kruczynski, Stanislaw W.; Frackiewicz, Henryk; Lozinski, Janusz; Chlopek, Zdzislaw; Danilczyk, Wiktor; Ranachowski, Jerzy; Janula, Janusz; and Wolski, Lech, 4,984,550, Cl. 123-478.000.

Wood, Anthony B.: *See*—
Norwood, David A.; Manns, Willims G.; and Wood, Anthony B., 4,985,927, Cl. 382-8.000.

Wood, Ken: *See*—
Maisch, Gunter; Haag, Alfons; and Wood, Ken, 4,985,002, Cl. 439-607.000.

Woodfield, David: *See*—
Madge, Robert; and Woodfield, David, 4,985,888, Cl. 370-85.500.

Woods, Ralf D.; and Hooker, Brent D., to Rockwell International Corporation. Real time, hostile environment, memory tester interface. 4,985,674, Cl. 324-158.00R.

Woodward Governor Company: *See*—
Leeson, Plato J.; and Wardle, John W., 4,984,505, Cl. 91-361.000.

Woodward, James R.: *See*—
Hudson, Earl K.; Martinez, Romulo M.; and Woodward, James R., 4,984,732, Cl. 228-173.200.

Woodward, Michael J.: *See*—
Langer, Friedrich H.; and Woodward, Michael J., 4,984,633, Cl. 166-241.000.

Woollatt, Derek; and Safford, George J., to Dresser Industries. Method of making a flat spring compressor valve. 4,984,361, Cl. 29-890.124.

Work, Sara L. R.: *See*—
Neilson, Diane H. R.; Work, Sara L. R.; Whaley, Edward L.; Kirkpatrick, Steven J.; and McCarthy, James P., 4,985,271, Cl. 426-595.000.

Woron, Robert P.: *See*—
Beacham, Dwight A.; Woron, Robert P.; and Whitefield, John T., 4,984,496, Cl. 84-625.000.

Worthington, Donald J. Air conditioning apparatus having variable sensible heat ratio. 4,984,433, Cl. 62-90.000.

Wouters, Wouter: *See*—
Hamminga, Derk; Haeck, Hans H.; Van Wijngaarden, Ineke; and Wouters, Wouter, 4,985,420, Cl. 514-211.000.
van Wijngaarden, Ineke; Hamminga, Derk; Haeck, Hans H.; and Wouters, Wouter, 4,985,424, Cl. 514-220.000.

Wragg, Roger D.: *See*—
Williams, Alan; Wilson, John D.; Wragg, Roger D.; Jones, Stephen D.; Komodromos, Costa; and Reynolds, Timothy J., 4,985,385, Cl. 502-84.000.

Wreede, John E.: *See*—
Moss, Gaylord E.; and Wreede, John E., 4,984,856, Cl. 350-3.670.

Wright, Antony P., to Dow Corning Corporation. Method for controlling release forces in release coatings. 4,985,274, Cl. 427-38.000.

Wright, Robin E.: *See*—
Chou, Hsin-Hsin; Lamanna, William M.; and Wright, Robin E., 4,985,321, Cl. 430-38.000.

Wuonola, Mark A.: *See*—
Wang, Chia-Lin J.; and Wuonola, Mark A., 4,985,429, Cl. 514-253.000.

Wyko Corporation: *See*—
Lange, Steven R., 4,984,893, Cl. 356-376.000.

Xerox Corporation: *See*—
Alexander, Thomas R.; Evangelista, Donato D.; and Leo, Michael F., 4,984,778, Cl. 271-117.000.
Camarata, Joseph M., 4,985,892, Cl. 370-123.000.
Drake, Donald J.; and Hawkins, William G., 4,985,710, Cl. 346-1.100.
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Yachigo, Shinichi: *See*—
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Yagawara, Shinji; Ohta, Wasaburo; and Manaka, Junji, to Ricoh Company, Ltd.; and Ricoh Seiki Company, Ltd. Gas detecting device and gas detecting system using the same. 4,984,446, Cl. 73-31.060.

Yagi, Takashi: *See*—
Masuda, Yoshihiro; Yagi, Takashi; and Nishimura, Eiji, 4,985,720, Cl. 354-299.000.

Yagihara, Morio: *See*—
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Hirano, Mitsunori; Hirano, Masato; Yagihara, Morio; and Okada, Hisashi, 4,985,348, Cl. 430-434.000.

Yahagi, Kazuyuki; and Suzuki, Toshio, to Kao Corporation. Microlatex hair cosmetic composition. 4,985,239, Cl. 424-70.000.

Yajima, Noboru: *See*—
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Yakymyshyn, Christopher P.: *See*—
Hass, Robert D., Jr.; Hodder, Brian G.; and Yakymyshyn, Christopher P., 4,984,462, Cl. 73-293.000.

Yale, Paul-Aime . Supporting device for trouble light. 4,985,817, Cl. 362-396.000.

Yamabe, Hidetoshi: *See*—
Moriizumi, Shuichi; Masuhara, Kenichi; Yamabe, Hidetoshi; Tomosue, Takao; Mori, Kouji; and Kaneko, Hisaharu, 4,985,104, Cl. 156-244.110.

Yamabe, Keiji; and Yoshinaga, Masao, to Nihon Cement Co., Ltd. Article sorting device. 4,984,675, Cl. 198-365.000.

Yamada, Hachiro: *See*—
Yamashina, Masakazu; Yamada, Hachiro; and Enomoto, Tadayoshi, 4,985,861, Cl. 364-746.200.

Yamada, Kiichi: *See*—
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,836, Cl. 364-426.020.
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,985,838, Cl. 364-426.020.

Yamada, Koichiro; Tanaka, Masaki; Ohba, Toshio; and Ohashi, Hiroshi, to Nissin Chemical Industry Co., Ltd. Silicone-containing fabric finishing agent. 4,985,155, Cl. 252-8.600.

Yamada, Masahiro: *See*—
Yasuki, Seijiro; and Yamada, Masahiro, 4,985,757, Cl. 358-31.000.

Yamada, Mikio; and Nakamura, Yoshinobu, to Sumitomo Rubber Industries, Ltd. Golf ball. 4,984,804, Cl. 273-235.00R.

Yamada, Toshio; and Kageyama, Ken-ichi, to Nippon Zoki Pharmaceutical Co., Ltd. Adenosine derivatives and pharmaceutical composition thereof. 4,985,409, Cl. 514-46.000.

Yamada, Wataru; Kido, Yukio; Abe, Hiroyuki; Minami, Shunji; Katoh, Shigeru; and Yano, Junro, to Casio Computer Co., Ltd. Electronic timepiece with analog time display unit and electrooptic data display unit. 4,985,878, Cl. 368-88.000.

Yamagishi, Hiromasa, to Sanyo Electric Co., Ltd. Cassette loading device. 4,985,791, Cl. 360-96.500.

Yamaguchi, Jiro: *See*—
Sakai, Minoru; Katoh, Kazunobu; Yamaguchi, Jiro; Okada, Hisashi; Yasuda, Tomokazu; and Satake, Masaki, 4,985,338, Cl. 430-264.000.

Yamaguchi, Kouichi: *See*—
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Yamaguchi, Masahisa: *See*—
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Yamaguchi, Takuji: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,573, Cl. 549-402.000.
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,985,574, Cl. 549-402.000.

Yamaguchi, Yasuhiro: *See*—
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Yamaha Corporation: *See*—
Fujimori, Junichi, 4,984,495, Cl. 84-603.000.
Inagaki, Yoshihiro; Yamamoto, Hideo; and Mishimoto, Tetsuo, 4,984,497, Cl. 84-626.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Kobayashi, Noboru, 4,984,528, Cl. 114-270.000.

Yamaichi Electric Mfg. Co., Ltd.: *See*—
Nishimoto, Masato, 4,984,991, Cl. 439-72.000.

Yamakawa, Masahiro: *See*—
Ishii, Akira; Yamakawa, Masahiro; and Toyomaki, Yoshio, 4,985,453, Cl. 514-386.000.

Yamamoto, Akira, to Hosiden Electronics Co., Ltd. Card connector. 4,984,994, Cl. 439-267.000.

Yamamoto, Haruo: *See*—
Tsuruoka, Tsutomu; Nakabayashi, Satoru; Fukuyasu, Harumi; Ishii, Yuuko; Tsuruoka, Takashi; Yamamoto, Haruo; Inouye, Shigeharu; and Kondo, Shinichi, 4,985,445, Cl. 514-315.000.

Yamamoto, Hideo: *See*—
Inagaki, Yoshihiro; Yamamoto, Hideo; and Mishimoto, Tetsuo, 4,984,497, Cl. 84-626.000.

Yamamoto, Hiroki: *See*—
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Yamamoto, Hisaomi: *See*—
Kobayashi, Nobuo; Yamamoto, Hisaomi; and Umehara, Kiyoshi, 4,985,307, Cl. 428-413.000.

Yamamoto, Shosaku; and Kakinuma, Kazuo, to Nippon Oil and Fats Co., Ltd. Primer compositions. 4,985,500, Cl. 525-123.000.

Yamamoto, Takashi: *See*—
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Yamamoto, Tomiaki; Murayama, Akio; Kondo, Susumu; Hato, Hitoshi; Kamagami, Shinichi; and Matsumoto, Shoichi, to Kabushiki Kaisha Toshiba. Liquid crystal display device having retardation films. 4,984,874, Cl. 350-334.000.

Yamamoto, Toshiteru: *See*—
Horiike, Satoru; Takemura, Hiroo; and Yamamoto, Toshiteru, 4,984,650, Cl. 180-227.000.

Yamamoto, Yasuyoshi: *See*—
Tada, Tatsuya; and Yamamoto, Yasuyoshi, 4,985,823, Cl. 346-160.100.

Yamanaka, Keiichro: *See*—
Furuya, Nobuaki; Ono, Takuhiro; Horiuchi, Naoya; Yamanaka, Keiichro; and Miyata, Takeo, 4,985,898, Cl. 372-106.000.

Yamane, Hisanori: *See*—
Kurosawa, Hideyuki; Hirai, Toshio; Yamane, Hisanori; and Yamashita, Tsutomu, 4,985,117, Cl. 156-659.100.

Yamane, Kouichi: *See*—
Nishizawa, Hiroyuki; Kashiwabara, Kimito; Nako, Osamu; Ishii, Mitsuaki; Yamane, Kouichi; Miyazaki, Masaaki; and Nishiyama, Ryoji, 4,984,552, Cl. 123-492.000.

Yamanouchi, Masahide: *See*—
Fujioka, Takashi; and Yamanouchi, Masahide, 4,985,753, Cl. 357-80.000.

Yamaoka, Fumiyuki: *See*—
Kakizaki, Shinobu; Yamaoka, Fumiyuki; Kikushima, Shigeru; and Emura, Junichi, 4,984,819, Cl. 280-707.000.

Yamashina, Masakazu; Yamada, Hachiro; and Enomoto, Tadayoshi, to NEC Corporation. High speed digital signal processor for signed digit numbers. 4,985,861, Cl. 364-746.200.

Yamashita, Akira; and Teramoto, Katsumi, to Kabushiki Kaisha SG. Multistation switch system. 4,985,822, Cl. 364-142.000.

Yamashita, Syuzo: *See*—
Mochizuki, Akira; Sato, Yoshio; Ogawara, Hisashi; and Yamashita, Syuzo, 4,985,147, Cl. 210-500.270.

Yamashita, Tsutomu: *See*—
Kurosawa, Hideyuki; Hirai, Toshio; Yamane, Hisanori; and Yamashita, Tsutomu, 4,985,117, Cl. 156-659.100.

Yamauchi, Kiyotaka: *See*—
Yoshizawa, Yoshihito; and Yamauchi, Kiyotaka, 4,985,089, Cl. 148-303.000.

Yamauchi, Shinichi: *See*—
Nishio, Takeyoshi; Yamauchi, Shinichi; Arashiro, Yusuke; Ohno, Kenyu; Yokoyama, Masuzo; Nakano, Hiroshi; Ohmori, Hiroshi; Mayumi, Junji; and Kihira, Michiharu, 4,985,495, Cl. 525-68.000.

Yamauchi, Yoshio: *See*—
Saito, Muneo; Yamauchi, Yoshio; Kashiwazaki, Hiromi; Sugawara, Michiaki; and Hondo, Toshinobu, 4,984,602, Cl. 137-487.500.

Yamazaki, Fumio: *See*—
Shindou, Yoshio; and Yamazaki, Fumio, 4,985,311, Cl. 428-623.000.

Yamazaki, Hajime: *See*—
Watanabe, Hideo; Yamazaki, Hajime; and Wakamatsu, Hiroyuki, 4,985,294, Cl. 428-209.000.

Yamazaki, Sakae: *See*—
Kasai, Masaaki; Yamazaki, Sakae; and Miyake, Sanae, 4,985,026, Cl. 604-403.000.

Yamazaki, Shoji: *See*—
Hashimoto, Yoshihiro; Yamazaki, Shoji; and Katoh, Shunsuke, 4,985,672, Cl. 324-158.00R.

Yanagi, Shigenori: *See*—
Tanaka, Shigeyoshi; and Yanagi, Shigenori, 4,985,882, Cl. 369-44.320.

Yanaura, Satoshi: *See*—
Kato, Naoki; Tsukahara, Toshiro; Yanaura, Satoshi; and Haraga, Kousuke, 4,985,794, Cl. 360-107.000.

Yang, Jane J. J.: *See*—
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Yang, Jui-Chiung: *See*—
Curley, John J., Jr.; Yang, Jui-Chiung; and Yeh, Tzu-Hung, 4,984,320, Cl. 12-146.0BR.

Yang, Ming-Jer. Tuning pen. 4,984,494, Cl. 84-474.000.

Yano, Junro: *See*—
Yamada, Wataru; Kido, Yukio; Abe, Hiroyuki; Minami, Shunji; Katoh, Shigeru; and Yano, Junro, 4,985,878, Cl. 368-88.000.

Yano, Shinji; Kawamata, Akira; Minematsu, Yoshihiro; Akazaki, Shuichi; Zama, Mitsuko; Imokawa, Genji; Takaishi, Naotake; Ohtomo, Tsuyoshi; and Komori, Takashi, to Kao Corporation. External skin care preparation. 4,985,547, Cl. 536-4.100.

Yano, Toshihiko: *See*—
Kishino, Hiroko; Matsuo, Noritada; Takagaki, Tohei; Tsushima, Kazunori; Yano, Toshihiko; and Torisu, Yoko, 4,985,457, Cl. 514-531.000.
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Yano, Toshihiko; Fujimoto, Izumi; and Takada, Yoji, 4,985,460, Cl. 514-594.000.

Yarrington, Arthur. Heli-hover amphibious surface effect vehicle. 4,984,754, Cl. 244-2.000.

Yarrington, Arthur G. Electro-optical detonator. 4,984,518, Cl. 102-201.000.

Yasuda, Naoshi: *See*—
Adachi, Ginya; Imanaka, Nobuhito; Aono, Hiromichi; Sugimoto, Eisuke; Sadaoka, Yoshihiko; Yasuda, Naoshi; Hara, Takeo; and Nagata, Masaki, 4,985,317, Cl. 429-191.000.

Yasuda, Nobuyoshi: *See*—
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Yasuda, Shuhei: *See*—
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Yasui, Katsuaki; Tada, Yasuo; and Takashima, Akira, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor pressure sensor. 4,984,466, Cl. 73-721.000.

Yasukawa, Takeshi: *See*—
Morishita, Mitsuharu; Uota, Kosaku; and Yasukawa, Takeshi, 4,984,647, Cl. 180-79.100.

Yasuki, Seijiro; and Yamada, Masahiro, to Kabushiki Kaisha Toshiba. Digital video signal processing system. 4,985,757, Cl. 358-31.000.

Yasumoto, Yoshio; Kageyama, Sadashi; Inoue, Shuji; Abe, Yoshio; and Uwabata, Hideyo, to Matsushita Electric Industrial Co., Ltd. Multiplex TV signal processing apparatus. 4,985,769, Cl. 358-141.000.

Yasuoka, Hidenori: *See*—
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Yato, Tadao; and Tanaka, Hiroshi, to Mitsubishi Metal Corporation. UO2 pellet fabrication process. 4,985,183, Cl. 264-0.500.

Yazu, Shuji: *See*—
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Yeh, Tzu-Hung: *See*—
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Yester, Francis R.: *See*—
Jentz, Bradley F.; and Yester, Francis R., 4,985,684, Cl. 329-327.000.
Yeung, Edward S.; and Chen, Shun-Le, to Iowa State University Research Foundation, Inc. Linearization of scan velocity of resonant vibrating-mirror beam deflectors. 4,984,857, Cl. 350-6.600.
Yezrielev, Albert I.; Romanelli, Michael G.; and Wellman, William E., to Exxon Chemical Patents, Inc. High solids acrylic-based coatings. 4,985,517, Cl. 526-208.000.
Yoden, Hiroyoshi: *See*—
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Yohda, Hiroshi; and Inoue, Yasushi, to Matsushita Electric Industrial Co., Ltd. Magnetic head. 4,985,797, Cl. 360-126.000.
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Yokoo, Yoshiharu; and Sugimoto, Seiji, to Kyowa Hakko Kogyo Co., Ltd. Process for renaturing fish growth hormone. 4,985,544, Cl. 530-399.000.
Yokoya, Hiroaki; Tachikawa, Hiromichi; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Electrophotographic printing plate. 4,985,323, Cl. 430-49.000.
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Yomogida, Toshihiko; Uchida, Akira; Kobayashi, Goro; and Nakamura, Hisanori, to Toyoda Koki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Transmission line branching device. 4,985,886, Cl. 370-1.000.
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Yoshida, Noble H.; and Brabender, John, to Mead Corporation, The. Process for the production of coating compositions containing microcapsules. 4,985,484, Cl. 524-379.000.
Yoshida, Nobuyuki; Tanaka, Hisao; and Fukuyama, Masahiro, to Sumitomo Chemical Company, Limited. Elastomer composition. 4,985,507, Cl. 525-387.000.
Yoshida, Satoshi: *See*—
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Yoshihara, Kenichi: *See*—
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Yoshioka, Hirosuke; Obata, Tokio; Fujii, Katsutoshi; Tsutsumiuchi, Kiyoshi; and Yoshiya, Haruo, to UBE Industries, Ltd.; and Institute of Physical and Chemical Research, The. Aralkylaminopyrimidine derivative, process for producing thereof and insecticide, acaricide and fungicide containing said derivative as active ingredient. 4,985,426, Cl. 514-241.000.
Yoshioka, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Driving method for a flat panel display apparatus and the flat panel display apparatus. 4,984,887, Cl. 350-332.000.
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Yoshizawa, Yoshihito; and Yamauchi, Kiyotaka, to Hitachi Metals, Ltd. Fe-base soft magnetic alloy powder and magnetic core thereof and method of producing same. 4,985,089, Cl. 148-303.000.
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Yost, Christopher. Trap actuated by an animal's weight. 4,984,382, Cl. 43-61.000.
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Young, Jean. Color-crayons and boardgames combination set. 4,984,808, Cl. 273-283.000.
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Yufu, Hiroshi: *See*—
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Zarif, Leila: *See*—
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Zarwell, Daniel W. Modular building block. 4,984,403, Cl. 52-476.000.
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Zeiss, Karl R.; and Degen, Paul, to Messer Griesheim. Process for hardening ballasts and other heaped structures. 4,985,276, Cl. 427-136.000.
Zejda, Jaroslav; and Schuhmacher, Manfred, to Leybold Aktiengesellschaft. Device for accepting and holding a workpiece in vacuum coating apparatus. 4,984,531, Cl. 118-50.000.
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Zernov, Jeffrey P., to Communications Systems, Inc. Printed circuit board switching system for resistor network. 4,985,808, Cl. 361-406.000.
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Ziemann, Andreas: *See*—
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Zilch, Harald; Mertens, Alfred; Von Der Saal, Wolfgang; Boehm, Erwin; and Strein, Klaus, to Boehringer Mannheim GmbH. Ureidoindoles, pharmaceutical compositions and methods for erythrocyte and thrombocyte aggregation inhibition. 4,985,448, Cl. 514-339.000.
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Nahlovsky, Boris D.; and Zimmerman, Gilbert A., 4,985,094, Cl. 149-19.920.
Zimmerman, Robert; and Marafino, Benedict J., Jr., to Cetus Corporation. Therapeutic combination of free-radical scavenger and tumor necrosis factor. 4,985,241, Cl. 424-85.100.
Zimmt, Werner: *See*—
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Zinn, Bernd, to Grote & Hartmann GmbH & Co. KG. Round pin bushing. 4,985,004, Cl. 439-851.000.
Zinser Textilmaschinen GmbH: *See*—
Block, Karl-Heinz, 4,984,335, Cl. 19-65.00A.
Stadele, Norbert; and Maeser, Martin, 4,984,422, Cl. 57-281.000.
Zion, Kenneth J.; and Tison, Allan J., to Stone Container Corporation. Stackable articulated carton tray apparatus. 4,984,734, Cl. 229-109.000.
Zitzmann, Werner: *See*—
Hildebrand, Heinz; Zitzmann, Werner; Arlt, Dieter; and Kolbl, Geinz, 4,985,364, Cl. 435-254.000.
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Howard, Robert G.; and Zivi, Edwin L., Jr., 4,984,452, Cl. 73-61.300.
Zojirushi Corporation: *See*—
Takahashi, Yoshinori; Misaki, Jun; and Karaki, Takayuki, 4,984,512, Cl. 99-327.000.
Takatsuki, Toyohiko; Kirimoto, Atsushi; and Nanba, Toshiyuki, 4,984,611, Cl. 141-65.000.
Zorini, Luigi O. Driving mechanism for the control of the needle-bar and tube-bars in fast knitting machines. 4,984,437, Cl. 66-208.000.
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Zweigart, Gerhard: *See*—
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501 Honda Giken Kogyo Kabushiki Kaisha: *See*—
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501 Kirin Beer Kabushikikaisha: *See*—
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501 Manaras Auto Doors, Inc.: *See*—
Wheatland, Graham, 4,984,387, Cl. 49-362.000.
501 Sallmetall BV: *See*—
Terwel, Roelof, 4,984,615, Cl. 144-367.000.
501 Toyota Jidosha Kabushiki Kaisha: *See*—
Minami, Takashi, 4,985,210, Cl. 422-169.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF JANUARY, 1991

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anderson, Paul: *See—*
McCord, Kenneth R.; Bullock, James K.; Gilroy, Keith; Gille, Henrick K.; Arkans, Edward J.; and Anderson, Paul, Re. 33,518, Cl. 128-675.000.

Arkans, Edward J.: *See—*
McCord, Kenneth R.; Bullock, James K.; Gilroy, Keith; Gille, Henrick K.; Arkans, Edward J.; and Anderson, Paul, Re. 33,518, Cl. 128-675.000.

Baxter International, Inc.: *See—*
McCord, Kenneth R.; Bullock, James K.; Gilroy, Keith; Gille, Henrick K.; Arkans, Edward J.; and Anderson, Paul, Re. 33,518, Cl. 128-675.000.

Bullock, James K.: *See—*
McCord, Kenneth R.; Bullock, James K.; Gilroy, Keith; Gille, Henrick K.; Arkans, Edward J.; and Anderson, Paul, Re. 33,518, Cl. 128-675.000.

Dale Electronics, Inc.: *See—*
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Gille, Henrick K.: *See—*
McCord, Kenneth R.; Bullock, James K.; Gilroy, Keith; Gille, Henrick K.; Arkans, Edward J.; and Anderson, Paul, Re. 33,518, Cl. 128-675.000.

Gilroy, Keith: *See—*
McCord, Kenneth R.; Bullock, James K.; Gilroy, Keith; Gille, Henrick K.; Arkans, Edward J.; and Anderson, Paul, Re. 33,518, Cl. 128-675.000.

Hall, Steven R.: *See—*
Person, Herman R.; Hesse, Joseph F.; and Hall, Steven R., Re. 33,520, Cl. 340-773.000.

Hesse, Joseph F.: *See—*
Person, Herman R.; Hesse, Joseph F.; and Hall, Steven R., Re. 33,520, Cl. 340-773.000.

Hitachi Keiyo Engineering Co., Ltd.: *See—*
Ibori, Satoshi; Shimotu, Tadao; and Yabu, Masatomo, Re. 33,519, Cl. 318-778.000.

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Ihara, Hirokazu: *See—*
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McCord, Kenneth R.; Bullock, James K.; Gilroy, Keith; Gille, Henrick K.; Arkans, Edward J.; and Anderson, Paul, to Baxter International, Inc. Pressure transducer assembly. Re. 33,518, Cl. 128-675.000.

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Person, Herman R.; Hesse, Joseph F.; and Hall, Steven R., to Dale Electronics, Inc. Dot matrix plasma display and method for driving same. Re. 33,520, Cl. 340-773.000.

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Color Communications, Inc.: *See—*
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Prater, Donald R., to James River Norwalk, Inc. Method of making end fill microwavable and/or ovenable container. B1 4,821,492, 1-15-91, Cl. 53-458.000.

Schneider, Quentin L.; and Schwarzbach, Richard J., to Pittaway Corp. A.C. powered detecting device with battery backup. B1 4,138,670, 1-15-91, Cl. 340-507.000.

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Hall, Roger C., to Visador Company. Door light panel. 313,855, 1-15-91, Cl. D25-103.000.

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Winston Furniture Company, Inc.: *See*—
Brown, William S., 313,704, Cl. D6-370.000.
Witt, Larry D. Fabric wall gripping device. 313,740, 1-15-91, Cl. D8-373.000.
Wolff, Joan P., to Coats & Clark, Inc. Pie topper plate. 313,730, 1-15-91, Cl. D7-675.000.
Wright, Geraldine M. Holder for cards and letters. 313,820, 1-15-91, Cl. D19-90.000.
Wyeth, Laurie D. Toy stuffed bear figure. 313,825, 1-15-91, Cl. D21-159.000.
Yamashita, Fumikazu, to Sumitomo Rubber Industries, Ltd. Automobile tire. 313,777, 1-15-91, Cl. D12-146.000.
Yau Kee, Peter M., to Rosalco, Inc. Combined table and lamp. 313,706, 1-15-91, Cl. D6-399.000.
Yokohama Rubber Co., Ltd., The: *See*—
Hazama, Hirohisa; Ogata, Masahiro; and Kuramochi, Izumi, 313,782, Cl. D12-148.000.
Yomo, Takashi, to Canon Kabushiki Kaisha. Ink cartridge. 313,812, 1-15-91, Cl. D18-22.000.
York, Stuart A.; and Weissmann, Dan, to Hoover Universal, Inc. Container wall. 313,750, 1-15-91, Cl. D9-394.000.
Zaccai, Gianfranco: *See*—
Arney, Michel D.; and Zaccai, Gianfranco, 313,766, Cl. D10-104.000.
Zoldessy, Monte. Apple-shaped picture frame. 313,700, 1-15-91, Cl. D6-306.000.

LIST OF PLANT PATENTEES

Bradford, Lowell G.: *See*—
Bradford, Norman G.; and Bradford, Lowell G., 7,421, Cl. 41.000.
Bradford, Norman G.; and Bradford, Lowell G. Nectarine tree (Rose Diamond). 7,421, 1-15-91, Cl. 41.000.
Florfis AG: *See*—
Schumann, Ingeborg, 7,422, Cl. 68.000.
Gardner, Leith M.: *See*—
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 7,420, Cl. 38.000.
James, George W.; and James, George W., II, to James Pecan Farms, Inc. Pecan tree named 'James Early' variety. 7,419, 1-15-91, Cl. 31.000.
James, George W., II: *See*—
James, George W.; and James, George W., II, 7,419, Cl. 31.000.
James Pecan Farms, Inc.: *See*—
James, George W.; and James, George W., II, 7,419, Cl. 31.000.
Nor'East Miniature Roses, Inc.: *See*—
Saville, F. Harmon, 7,418, Cl. 9.000.
Saville, F. Harmon, to Nor'East Miniature Roses, Inc. Miniature rose plant named Savarita. 7,418, 1-15-91, Cl. 9.000.
Schumann, Ingeborg, to Florfis AG. Geranium plant named Fisrix. 7,422, 1-15-91, Cl. 68.000.
VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Yellow Envy. 7,423, 1-15-91, Cl. 78.000.
Yoder Brothers, Inc.: *See*—
VandenBerg, Cornelis P., 7,423, Cl. 78.000.
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G. Interspecific tree "Flavor Queen". 7,420, 1-15-91, Cl. 38.000.
Zaiger, Gary N.: *See*—
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 7,420, Cl. 38.000.
Zaiger, Grant G.: *See*—
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 7,420, Cl. 38.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 15, 1991

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

16	4,984,299
18	4,984,300
161 A	4,984,301
206	4,984,302
227	4,984,303
401	4,984,304

CLASS 4

213	4,984,305
224	4,984,306
225	4,984,307
252 R	4,984,308
288	4,984,309
347	4,984,310
354	4,984,311
378	4,984,312
542	4,984,313
663	4,984,314

CLASS 5

431	4,984,315
508	4,984,316

CLASS 8

94.15	4,985,039
128.1	4,985,040
130.1	4,985,041
149.1	4,984,317
158	4,984,318
421	4,985,042
639	4,985,043
	4,985,044
	4,985,045
654	4,985,046

CLASS 10

86 A	4,984,319

CLASS 12

146 BR	4,984,320

CLASS 14

71.5	4,984,321

CLASS 15

104.061	4,984,322
104.920	4,984,323
236.05	4,984,324
250.2	4,984,325
256.5	4,984,326
267	4,984,327
322	4,984,328
387	4,984,329
415.1 R	4,984,330

CLASS 16

51	4,984,331
93 R	4,984,332
266	4,984,333

CLASS 19

48 R	4,984,334
65 A	4,984,335
80 R	4,984,336

CLASS 24

16 R	4,984,337
431	4,984,338
452	4,984,339

CLASS 28

104	4,984,340
185	4,984,341

CLASS 29

25.03	4,984,342
116.2	4,984,343
261	4,984,344
263	4,984,345
277	4,984,346
402.06	4,984,347
423	4,984,348
430	4,984,349
525.1	4,984,350
568	4,984,351
	4,984,352
714	4,984,353
740	4,984,354
741	4,984,355
788	4,984,356
828	4,984,357
830	4,984,358
879	4,984,359
888.061	4,984,966
890.053	4,984,360
890.124	4,984,361
890.128	4,984,362

CLASS 30

32	4,984,364
34.05	4,984,365
124	4,984,366
147	4,984,367
231	4,984,368
374	4,984,369

CLASS 33

241	4,984,370
263	4,984,371
265	4,984,372
	4,984,373

CLASS 34

50	4,984,374

CLASS 36

30 R	4,984,376
119	4,984,375
134	4,984,377

CLASS 38

102.2	4,984,378

CLASS 40

334	4,984,379
455	4,984,380

CLASS 42

1.01	4,984,381

CLASS 43

42.13	4,984,950
61	4,984,382

CLASS 44

394	4,985,048
433	4,985,047
629	4,985,049

CLASS 47

9	4,984,384

CLASS 49

280	4,984,385
352	4,984,386
362	4,984,387
501	4,984,388
502	4,984,389

CLASS 51

5 D	4,984,390
100 R	4,984,391
165 R	4,984,393
165.77	4,984,392
165.9	4,984,394
242	4,984,395
293	4,985,050
309	4,985,051
424	4,984,396
425	4,984,397

CLASS 52

7	4,984,398
64	4,984,399
241	4,984,400
378	4,984,401
398	4,984,402
476	4,984,403
480	4,984,404
506	4,984,405
594	4,984,406
648	4,984,407
741	4,984,408

CLASS 53

53	4,984,409
116	4,984,410
118	4,984,411
387	4,984,412
458	B1 4,821,492
465	4,984,413
478	4,984,414
	4,984,415
480	4,984,416

CLASS 55

26	4,985,052
158	4,985,053
178	4,985,054
189	4,985,055
240	4,985,056
269	4,985,057
457	4,985,058

CLASS 56

11.3	4,984,417
13.6	4,984,418
202	4,984,419
203	4,984,420
328.1	4,984,421

CLASS 57

281	4,984,422

CLASS 60

39.161	4,984,425
39.31	4,984,423
39.94	4,984,424
281	4,984,426
428	4,984,427
517	4,984,428
752	4,984,429

CLASS 62

51.1	4,984,430
85	4,984,431
87	4,984,432
90	4,984,433
94	4,984,434
434	4,984,435

CLASS 65

62	4,985,059

CLASS 66

144	4,984,436
208	4,984,437

CLASS 68

5 C	4,984,439
27	4,984,438
200	4,984,440

CLASS 70

277	4,984,441
456 R	4,984,442

CLASS 71

6	4,985,060
68	4,985,061
77	4,985,062
88	4,985,063
90	4,985,064
92	4,985,065
	4,985,066

CLASS 72

67	4,984,443
205	4,984,444
360	4,984,445

CLASS 73

31.06	4,984,446
38	4,984,447
40.50 R	4,984,448
40.7	4,984,450
49.2	4,984,449
53	4,984,451
61.3	4,984,452
81	4,984,453
117.3	4,984,454
118.1	4,984,455
118.2	4,984,456
149	4,984,457
159	4,984,458
178 R	4,984,459
204.15	4,984,460
249	4,984,461
293	4,984,462
516 R	4,984,463
517 R	4,984,464
602	4,984,465
721	4,984,466
	4,984,467
727	4,984,468
770	4,984,469
861.22	4,984,470
861.24	4,984,471
861.38	4,984,472
862.19	4,984,473
862.33	4,984,474
864.22	4,984,475
864.35	4,984,476

CLASS 74

89.15	4,984,477
372	4,984,478
480 R	4,984,479
573 R	4,984,480
577 S	4,984,481
650	4,984,482
866	4,984,483
	4,984,484
	4,984,485
868	4,984,486

CLASS 75

10.1	4,985,067
10.18	4,985,069
238	4,985,070
246	4,985,071
	4,985,072
255	4,985,073
444	4,985,074
460	4,985,075
501	4,985,068

CLASS 76

107.1	4,984,487
115	4,984,488

CLASS 81

13	4,984,503
124.2	4,984,489

CLASS 83

13	4,984,490
338	4,984,491
697	4,984,492

CLASS 84

313	4,984,493
474	4,984,494
603	4,984,495
625	4,984,496
626	4,984,497
730	4,984,498
734	4,984,499

CLASS 86

1.1	4,984,500
36	4,984,501

CLASS 87

8	4,984,502

CLASS 89

163	4,984,504

CLASS 91

361	4,984,505
369.2	4,984,506
376 R	4,984,507

CLASS 92

13.5	4,984,508
107	4,984,509

CLASS 98

1	4,984,510

CLASS 99

287	4,984,511
327	4,984,512
349	4,984,513
353	4,984,514
449	4,984,515

CLASS 100

90	4,984,516

CLASS 101

470	4,984,517

CLASS 102

201	4,984,518
217	4,984,519
313	4,984,520

CLASS 104

290	4,984,521

CLASS 105

15	4,984,522
155	4,984,523

CLASS 106

1.26	4,985,076
22	4,985,077
419	4,985,078
502	4,985,079
672	4,985,080
772	4,985,081

CLASS 110

346	4,984,524

CLASS 112

128	4,984,525
162	4,984,526

CLASS 114

264	4,984,527
270	4,984,528

CLASS 116

234	4,984,529

CLASS 118

43	4,984,530
50	4,984,531
242	4,984,532
419	4,984,533
723	4,984,534

CLASS 119

17	4,984,535
51.04	4,984,536
72.5	4,984,537

CLASS 123

41.1	4,984,538
41.42	4,984,539
73 C	4,984,540
90.11	4,984,541
179 A	4,984,543
179 G	4,984,542
197 AC	4,984,544
399	4,984,545
425	4,984,546
463	4,984,547
470	4,984,548
472	4,984,549
478	4,984,550
489	4,984,551
492	4,984,552
494	4,984,553
516	4,984,554
545	4,984,555

CLASS 124

5	4,984,556

CLASS 126

21 A	4,984,557
39 R	4,984,558
43	4,984,559
169	4,984,560
417	4,984,561
500	4,984,562

CLASS 127

33	4,985,082

CLASS 128

6	4,984,563
20	4,984,564
24 OEL	4,984,565
51	4,984,568
57	4,984,569
66	4,984,583
90	4,984,566
156	4,984,570
371	4,984,571
419 D	4,984,572
653	4,984,573
653 A	4,984,574
660.02	4,984,567
660.03	4,984,575
661.07	4,984,576
675	Re.33,518
681	4,984,577
732	4,984,578
747	4,984,579
763	4,984,580
772	4,984,581
844	4,984,582
898	4,984,584
899	4,984,585

CLASS 129

892.1	4,984,363

CLASS 131

256	4,984,586
305	4,984,587
364	4,984,588
365	4,984,589

CLASS 132

161	4,984,590
229	4,984,591
285	4,984,592

CLASS 134

13	4,984,593
21	4,984,594
26	4,985,083
38	4,984,595
58.0 DL	4,984,596
95	4,984,597
166 R	4,984,598

CLASS 135

25 R	4,984,599

CLASS 137

82	4,984,600
486	4,984,601
487.5	4,984,602
489	4,984,603

CLASS 138

126	4,984,604
149	4,984,605

CLASS 139

25	4,984,606
79	4,984,607
383 A	4,985,084
434	4,984,608
449	4,984,609

CLASS 141

5	4,984,610
65	4,984,611
198	4,984,612

CLASS 144

27	4,984,613
220	4,984,614
367	4,984,615

CLASS 148

101	4,985,085
	4,985,086
273	4,985,087
303	4,985,089
305	4,985,088
320	4,985,090
325	4,985,091
326	4,985,092

CLASS 149

19.4	4,985,093
19.92	4,985,094

CLASS 152

209 A	4,984,616

CLASS 156

64	4,985,096
87	4,985,097
89	4,985,098
94	4,985,099
064	4,985,095
110.1	4,985,100
154	4,985,101
163	4,985,102
184	4,985,103
244.11	4,985,104
261	4,985,105
272.4	4,985,108
276	4,985,106
299	4,985,107
345	4,985,109
540	4,985,110
640	4,985,111
643	4,985,112
	4,985,113
	4,985,114
654	4,985,115
656	4,985,116
659.1	4,985,117

CLASS 159

47.3	4,985,118

CLASS 160

84.1 4,984,617
351 4,984,619

CLASS 162

149 4,985,119
199 4,985,120
352 4,985,121

CLASS 164

160.1 4,984,620

CLASS 165

10 4,984,621
11.2 4,984,627
26 4,984,628
47 4,984,622
95 4,984,629
104.16 4,984,624
104.25 4,984,625
104.33 4,984,623
151 4,984,626
173 4,984,630

CLASS 166

115 4,984,631
237 4,984,632
241 4,984,633
250 4,984,634
261 4,984,635
277 4,984,636

CLASS 169

61 4,984,637

CLASS 172

221 4,984,638

CLASS 173

100 4,984,639
123 4,984,640

CLASS 174

52.4 4,985,597
93 4,985,598
138 F 4,985,599
255 4,985,600
261 4,985,601

CLASS 175

170 4,984,641
329 4,984,642
341 4,984,643

CLASS 177

132 4,984,644

CLASS 178

18 4,985,602

CLASS 180

65.6 4,984,645
79.1 4,984,646
4,984,647
181 4,984,648
197 4,984,649
227 4,984,650
268 4,984,651

CLASS 181

104 4,984,652
148 4,984,653

CLASS 182

179 4,984,654
204 4,984,655
222 4,984,656

CLASS 187

8.47 4,984,657
58 4,984,658
108 4,984,659
134 4,984,660

CLASS 188

71.5 4,984,661

CLASS 190

107 4,984,662

CLASS 192

0.02 R 4,984,663
3.3 4,984,664
7 4,984,665
4,984,666
56 R 4,984,667
84 C 4,984,668
110 R 4,984,669

CLASS 194

317 4,984,670

CLASS 198

328 4,984,671
333 4,984,672
4,984,673
365 4,984,674
4,984,675
4,984,676
418.6 4,984,677
443 4,984,678
750 4,984,679
803.9 4,984,680
811 4,984,681

CLASS 200

341 4,985,603
503 4,985,604
528 4,985,605

CLASS 203

11 4,985,122

CLASS 204

72 4,985,124
153.1 4,985,123
153.12 4,985,125
153.14 4,985,126
182.4 4,985,127
182.8 4,985,128
299 R 4,985,129
415 4,985,130

CLASS 206

5 4,984,682
38 4,984,683
315.3 4,984,684
334 4,984,685
366 4,984,686
373 4,984,687
455 4,984,688
499 4,984,689
503 4,984,690
506 4,984,691

CLASS 208

13 4,985,131
65 4,985,132
78 4,985,133
89 4,985,134
114 4,985,135
153 4,985,136
251 H 4,985,137
308 4,985,138
321 4,985,139
347 4,985,140

CLASS 209

583 4,984,692

CLASS 210

90 4,985,141
130 4,985,142
198.2 4,985,143
4,985,144
321.75 4,985,145
413 4,985,146
500.27 4,985,147
519 4,985,148
603 4,985,149
661 4,985,150
689 4,985,151
771 4,985,152
782 4,985,153

CLASS 211

88 4,984,693
186 4,984,694

CLASS 212

231 4,984,695

CLASS 213

151 4,984,696

CLASS 215

11.1 4,984,697
207 4,984,698
231 4,984,699
251 4,984,700
256 4,984,701
272 4,984,702
350 4,984,703

CLASS 219

10.55 E 4,985,606
4,985,607
69.12 4,985,608
69.17 4,985,609
70 4,985,610
87 4,985,611
116 4,985,612

CLASS 220

3.9 4,984,705
23.4 4,984,704
334 4,984,706
412 4,984,707
660 4,984,708

CLASS 221

7 4,984,709
242 4,984,710

CLASS 222

82 4,984,711
95 4,984,712
105 4,984,713
109 4,984,714
129 4,984,715
153 4,984,716
183 4,984,717
390 4,984,718
454 4,984,719
531 4,984,720

CLASS 223

96 4,984,721

CLASS 224

42.43 4,984,722
148 4,984,723
257 4,984,724
311 4,984,725
331 4,984,726

CLASS 225

83 4,984,727

CLASS 226

172 4,984,728

CLASS 227

128 4,984,729

CLASS 228

1.1 4,984,730
102 4,984,731
173.2 4,984,732

CLASS 229

72 4,984,733
109 4,984,734

CLASS 235

101 4,985,613
440 4,985,614
492 4,985,615
494 4,985,616

CLASS 236

92 B 4,984,735

CLASS 237

2 A 4,984,736

CLASS 238

281 4,984,737

CLASS 239

88 4,984,738
193 4,984,739
232 4,984,740
265.17 4,984,741
373 4,984,742
559 4,984,743
585 4,984,744
587 4,984,745
722 4,984,746

CLASS 241

55 4,984,747
65 4,984,748

CLASS 242

35.5 R 4,984,749
58.1 4,984,750
74 4,984,751
107.4 A 4,984,752
199 4,984,753

CLASS 244

2 4,984,754
102 SS 4,984,755
137.1 4,984,756
137.4 4,984,757

CLASS 248

95 4,984,758
99 4,984,759
126 4,984,760
188.7 4,984,761
216.1 4,984,762
218.1 4,984,763

CLASS 249

33 4,984,764

CLASS 250

208.1 4,985,617
4,985,618
4,985,619
4,985,620
213 A 4,985,621
226 4,985,622
231.16 4,985,623
237 G 4,985,624
288 4,985,625
292 4,985,626
306 4,985,627
310 4,985,628
327.2 4,985,629
4,985,630
361 R 4,985,631
372 4,985,632
486.1 4,985,633
492.2 4,985,634
492.300 4,985,635
559 4,985,636

CLASS 251

5 4,984,765
129.11 4,984,766
297 4,984,767

CLASS 252

8.554 4,985,154
8.6 4,985,155
49.3 4,985,158
49.6 4,985,156
4,985,157
50 4,985,159
51.5 R 4,985,160
54 4,985,161
60 4,985,162
62 4,985,163
4,985,164
62.54 4,985,165
4,985,166
62.58 4,985,167
67 4,985,168
69 4,985,169
117 4,985,170
299.67 4,985,172
314 4,985,173
408.1 4,985,174
506 4,985,175
521 4,985,176
547 4,985,177
587 4,985,178
4,985,179

CLASS 257

16 4,984,768

CLASS 260

404 4,985,180

CLASS 261

87 4,985,181
94 4,985,182

CLASS 264

0.5 4,985,183
1.5 4,985,185
1.7 4,985,186
6 4,985,184
13 4,985,187
22 4,985,188
26 4,985,189
122 4,985,190
135 4,985,191
177.1 4,985,192
184 4,985,193
247 4,985,194
320 4,985,195
516 4,985,196
564 4,985,197

CLASS 266

44 4,984,769
106 4,984,770
142 4,984,771

CLASS 267

140.1 4,984,777
276 4,984,776

CLASS 269

41 4,984,775
322 4,984,774

CLASS 270

5 4,984,773
30 4,984,772

CLASS 271

117 4,984,778
227 4,984,779
292 4,984,780

CLASS 272

8 R 4,984,782
62 4,984,810
67 4,984,784
70 4,984,785
119 4,984,786
565 R 4,984,783

CLASS 273

1.5 R 4,984,787
22 4,984,788
26 C 4,984,789
32 B 4,984,790
32 H 4,984,791
73 C 4,984,792
75 4,984,793
80.1 4,984,794
126 R 4,984,795
142 E 4,984,796
145 C 4,984,797
157 R 4,984,798
169 4,984,799
173 4,984,800
186 A 4,984,801
192 4,984,802
235 R 4,984,803
4,984,804
248 4,984,805
255 4,984,806
262 4,984,807
283 4,984,808
401 4,984,809

CLASS 277

3 4,984,811
153 4,984,812

CLASS 279

1 K 4,984,844

CLASS 280

30 4,984,813
35 4,984,814
91 4,984,815
625 4,984,816
680 4,984,817
701 4,984,818
707 4,984,819
4,984,820
728 4,984,821
804 4,984,822

CLASS 283

81 4,984,823
91 4,984,824
98 4,984,825

CLASS 285

101 4,984,826
133.1 4,984,827
200 4,984,828
334 4,984,829
368 4,984,830
379 4,984,831

CLASS 290

48 4,985,637

CLASS 292

36 4,984,832
96 4,984,833
297 4,984,834
341.16 4,984,835

CLASS 294

66.1 4,984,836

CLASS 296

3 4,984,837
75 4,984,838
93 4,984,839
97.6 4,984,840
118 4,984,841
155 4,984,842
213 4,984,843

CLASS 297

250 4,984,845
317 4,984,846
411 4,984,847
440 4,984,848
482 4,984,849

CLASS 299

37 4,984,850

CLASS 301

37 P 4,984,851

CLASS 303

15 4,984,852
22.8 4,984,853

CLASS 307

38 4,985,638
262 4,985,639
269 4,985,640
272.3 4,985,641
304 4,985,642
443 4,985,643
4,985,644
446 4,985,645
448 4,985,646
449 4,985,647
456 4,985,648
465 4,985,649
4,985,650

CLASS 310

12 4,985,651
15 4,985,652
88 4,985,653
249 4,985,654
344 4,985,655

CLASS 312

330.1 4,984,854

CLASS 313

318 4,985,656
362.100 4,985,657
477 R 4,985,658

CLASS 315

3.5 4,985,659
82 4,985,660
87 4,985,661
90 4,985,662
169.3 4,985,663
209 R 4,985,664
386 4,985,665

CLASS 318

434 4,985,666
567 4,985,667
568.2 4,985,668
685 4,985,669
778 Re.33,519

CLASS 322

28 4,985,670

CLASS 323

282 4,985,671

CLASS 324

158 R 4,985,672
4,985,673
4,985,674
4,985,675
4,985,676
309 4,985,677
318 4,985,678
4,985,679
322 4,985,680
501 4,985,681
557 4,985,682

CLASS 328

133 4,985,683

CLASS 329

327 4,985,684
349 4,985,685

CLASS 330

124 R 4,985,686

CLASS 331

69 4,985,687

CLASS 332

123 4,985,688

CLASS 333

101 4,985,689
222 4,985,690

CLASS 335

299 4,985,735

CLASS 336

130 4,985,691

CLASS 340

407 4,985,692
426 4,985,693
4,985,694
507 B1 4,138,670
571 4,985,695
618 4,985,696
750 4,985,697
773 Re.33,520
784 4,985,698
825.240 4,985,699

CLASS 341

59 4,985,700
61 4,985,701
118 4,985,702
141 4,985,703

CLASS 342

25 4,985,704
69 4,985,705
352 4,985,706
370 4,985,707

CLASS 343

771 4,985,708
787 4,985,709

CLASS 346

1.1 4,985,710
76 PH 4,985,711
4,985,712
82 4,985,713
107 R 4,985,714
140 R 4,985,715
159 4,985,716
160.1 4,985,823

CLASS 350

1.1 4,984,855
3.67 4,984,856
6.6 4,984,857
6.8 4,984,858
96.10 4,984,860
4,984,862
96.11 4,984,861
4,984,863

96.16 4,984,864
96.20 4,984,865
4,984,866
96.21 4,984,867
4,984,868
96.23 4,984,869
96.24 4,984,859
96.34 4,984,870
117 4,984,871
321 4,984,872
332 4,984,887
334 4,984,874
337 4,984,873
377 4,984,875
423 4,984,876
4,984,877
469 4,984,878
551 4,984,879
616 4,984,880
4,984,881
632 4,984,882

CLASS 351

212 4,984,883

CLASS 352

299.1 4,985,171

CLASS 354

174 4,985,719
299 4,985,720
308 4,985,721
319 4,985,722
400 4,985,723
4,985,724
416 4,985,725
432 4,985,726

CLASS 355

27 4,985,727
77 4,985,728
206 4,985,729
208 4,985,730
210 4,985,731
256 4,985,732
282 4,985,733
298 4,985,734
311 4,985,736

CLASS 356

73.1 4,984,884
153 4,984,885
237 4,984,886
328 4,984,888
336 4,984,889
356 4,984,890
358 4,984,891
4,984,898
372 4,984,892
376 4,984,893
382 4,984,894
423 4,984,895
429 4,984,896

CLASS 357

4 4,985,737
22 4,985,738
4,985,739
23.4 4,985,740
23.5 4,985,717
23.6 4,985,718
34 4,985,741
4,985,742
39 4,985,743
43 4,985,744
49 4,985,745
67 4,985,746
68 4,985,747
69 4,985,748
70 4,985,749
71 4,985,750
72 4,985,751
79 4,985,752
80 4,985,753

CLASS 358

22 4,985,755
4,985,756
23 4,985,754
31 4,985,757
44 4,985,758
79 4,985,759
80 4,985,760
84 4,985,761
87 4,985,762
100 4,985,763
105 4,985,764
4,985,765
133 4,985,766
4,985,767
136 4,985,768
141 4,985,769
152 4,985,770
160 4,985,771
181 4,985,772
211 4,985,773
213.13 4,985,775
213.19 4,985,774
213.23 4,985,776
227 4,985,777
296 4,985,778
298 4,985,779
299 4,985,780
324 4,985,781
335 4,985,782
4,985,783
342 4,985,784

CLASS 360

62 4,985,785
70 4,985,786
78.02 4,985,787
85 4,985,788
4,985,789
92 4,984,897
96.5 4,985,790
4,985,791
99.08 4,985,792
105 4,985,793
107 4,985,794
115 4,985,795
122 4,985,796
126 4,985,797
132 4,985,798
133 4,985,799

CLASS 361

113 4,985,800
215 4,985,801
302 4,985,802
383 4,985,803
384 4,985,804
386 4,985,805
392 4,985,806
405 4,985,807
406 4,985,808

CLASS 362

31 4,985,809
81 4,985,810
101 4,985,811
158 4,985,812
186 4,985,813
240 4,985,814
294 4,985,815
303 4,985,816
396 4,985,817

CLASS 363

19 4,985,818
37 4,985,819
49 4,985,820
95 4,985,821

CLASS 364

142 4,985,822
187 4,985,824
200 Re.33,521
4,985,825
4,985,826
4,985,827
4,985,828
4,985,829
4,985,830
4,985,831
4,985,832
408 4,985,833
413.22 4,985,834
424.05 4,985,835
426.02 4,985,836
4,985,837
4,985,838
4,985,839
474.29 4,985,840
474.33 4,985,841
478 4,985,842
483 4,985,843
487 4,985,844
492 4,985,845
513 4,985,846
516 4,985,847
518 4,985,848
4,985,849
519 4,985,850
4,985,852
521 4,985,853
522 4,985,854
4,985,855
4,985,856
551.01 4,985,857
557 4,985,858
565 4,985,859
578 4,985,860
746.2 4,985,861
786 4,985,862
900 4,985,863

CLASS 365

189.06 4,985,864
194 4,985,865
200 4,985,866
221 4,985,867
222 4,985,868
226 4,985,869
228 4,985,870
230.06 4,985,871
230.09 4,985,872

CLASS 366

302 4,984,899
305 4,984,900

CLASS 367

27 4,985,873
122 4,985,874

CLASS 368

5 4,985,875
23 4,985,876
76 4,985,877
88 4,985,878
89 4,985,879

CLASS 369

13 4,985,880
4,985,881
44.26 4,984,901
44.32 4,985,882
69 4,985,883
263 4,985,884
275.1 4,985,885

CLASS 370

1 4,985,886
58.2 4,985,887
85.5 4,985,888
94.1 4,985,889
4,985,890
110.1 4,985,891
123 4,985,892

CLASS 371

16.2 4,985,893
16.5 4,985,894
37.7 4,985,895

CLASS 372

38 4,985,896
50 4,985,897
106 4,985,898

CLASS 374

1 4,984,902
123 4,984,903
139 4,984,904
143 4,984,905

CLASS 375

1 4,985,899
10 4,985,900
4,985,901
14 4,985,902
36 4,985,903
38 4,985,904

CLASS 376

442 4,985,199

CLASS 377

79 4,985,905

CLASS 378

18 4,985,906
99 4,985,908
139 4,985,907
173 4,985,909

CLASS 379

27 4,985,910
32 4,985,917
53 4,985,911
61 4,985,912
76 4,985,913
88 4,985,914
165 4,985,915
178 4,985,916
356 4,985,918

CLASS 380

18 4,985,919
23 4,985,920
24 4,985,921
59 4,985,922

CLASS 381

38 4,985,923
43 4,985,924
72 4,985,925
77 4,985,926

CLASS 382

3 4,985,928
8 4,985,927
48 4,985,929
56 4,985,930

CLASS 383

4 4,984,906
109 4,984,907

CLASS 384

478 4,984,908
493 4,984,909
563 4,984,910

CLASS 400

124 4,984,911
240.2 4,984,912
249 4,984,913
585 4,984,914
613 4,984,915
613.1 4,984,916
656 4,984,917

CLASS 401

4 4,984,918
78 4,984,919
127 4,984,920
208 4,984,921
277 4,984,922
279 4,984,923

CLASS 402

4 4,984,924
8 4,984,925

CLASS 403

4,984,926
30 4,984,927
228 4,984,928
230 4,984,929
290 4,984,930
362 4,984,931

CLASS 404

72 4,984,932

CLASS 405

150 4,984,933
168 4,984,934
224 4,984,935
232 4,984,936
260 4,984,937
261 4,984,938

CLASS 406

84 4,984,939

CLASS 407

119 4,984,940

CLASS 408

104 4,984,941
127 4,984,942
144 4,984,943
223 4,984,944

CLASS 411

30 4,984,945
34 4,984,946
43 4,984,947

CLASS 412

1 4,984,948
8 4,984,949

CLASS 414

1 4,984,951
180 4,984,952
331 4,984,953
416 4,984,954
546 4,984,955
699 4,984,956
723 4,984,957
4,984,958
744.3 4,984,959
752 4,984,960
786 4,984,961
4,984,962
789.5 4,984,963

CLASS 415

55.4 4,984,964
155 4,984,965

CLASS 416

140 4,984,967
146 A 4,984,968

CLASS 417

58 4,984,969
271 4,984,970
363 4,984,971
420 4,984,972
422 4,984,973

CLASS 418

87 4,984,974
181 4,984,975

CLASS 419

19 4,985,200

CLASS 420

109 4,985,201
590 4,985,202

CLASS 422

56 4,985,204
4,985,205
4,985,206
4,985,207
135 4,985,208
140 4,985,209
169 4,985,210
171 4,985,211
179 4,985,212
186.01 4,985,213
188 4,985,214
190 4,985,203

CLASS 423

29 4,985,216
235 4,985,217
4,985,218
4,985,219
240 4,985,220
265 4,985,221
279 4,985,222
328 4,985,223
344 4,985,224
412 4,985,225
446 4,985,226
4,985,227
584 4,985,228
608 4,985,229
650 4,985,230
652 4,985,231

CLASS 424

4.1 4,985,232
9 4,985,233
45 4,985,234
49 4,985,235
52 4,985,236
59 4,985,237
66 4,985,238
70 4,985,239
71 4,985,240
85.1 4,985,241
85.4 4,985,242
85.8 4,985,243
89 4,985,244
94.3 4,985,245
115 4,985,246
195.1 4,985,247
4,985,248
4,985,249
401 4,985,250
404 4,985,251
439 4,985,252
488 4,985,253
520 4,985,254
583 4,985,255
697 4,985,256
705 4,985,257

CLASS 425

35 4,984,976
145 4,984,977
185 4,984,978
374 4,984,979
595 4,984,980

CLASS 426

8 4,985,258
46 4,985,259
87 4,985,260
243 4,985,261
302 4,985,262
4,985,263
330.4 4,985,264
425 4,985,265
438 4,985,266
473 4,985,267
482 4,985,268
515 4,985,270
560 4,985,269
595 4,985,271
609 4,985,272

CLASS 427

35 4,985,273
38 4,985,274
106 4,985,275
136 4,985,276
180 4,985,277
195 4,985,278
209 4,985,279
244 4,985,280
248.1 4,985,281
393 4,985,282
424 4,985,283
428 4,985,284

CLASS 428

1 4,985,285
34.5 4,985,287
34.7 4,985,286
36.5 4,985,303
40 4,985,288
64 4,985,289
76 4,985,290
116 4,985,291
194 4,985,292
209 4,985,293
4,985,294
213 4,985,295
220 4,985,296
260 4,985,297
288 4,985,298
314.4 4,985,299
332 4,985,300
336 4,985,301
343 4,985,302
373 4,985,304
389 4,985,305
410 4,985,306
413 4,985,307
422 4,985,308
570 4,985,309
620 4,985,310
623 4,985,311
627 4,985,312
4,985,313
694 4,985,314

CLASS 429

33 4,985,315
44 4,985,316
191 4,985,317
223 4,985,318

CLASS 430

5 4,985,319
30 4,985,320
38 4,985,321
49 4,985,322
4,985,323
56 4,985,324
59 4,985,325
96 4,985,326
106.6 4,985,327
110 4,985,328
115 4,985,329
130 4,985,330
138 4,985,331
176 4,985,332
192 4,985,333
207 4,985,334
209 4,985,335
223 4,985,336
254 4,985,337
264 4,985,338
270 4,985,339
4,985,340
280 4,985,342
285 4,985,343
287 4,985,341
325 4,985,344
335 4,985,345
350 4,985,346
393 4,985,347
434 4,985,348
495 4,985,349
567 4,985,350
598 4,985,351

CLASS 431

80 4,984,981

CLASS 432

14 4,984,983

CLASS 433

88 4,984,984
123 4,984,985

CLASS 434

98 B1 4,379,696
247 4,984,986
265 4,984,987
380 4,984,988
401 4,984,989

CLASS 435

6 4,985,352
7 4,985,353
13 4,985,354
42 4,985,355
69.4 4,985,356
128 4,985,357
134 4,985,358
172.3 4,985,359
189 4,985,360
218 4,985,361
226 4,985,362
253.3 4,985,363
254 4,985,364
280 4,985,365
4,985,366

CLASS 437

32 4,985,367
41 4,985,369
038 4,985,368
129 4,985,370
189 4,985,371
192 4,985,372
195 4,985,373
229 4,985,374

CLASS 439

63 4,984,990
72 4,984,991
108 4,984,992

CLASSIFICATION OF PATENTS

131 4,984,982
157 4,984,993
259 4,984,383
267 4,984,994
321 4,984,995
326 4,984,996
331 4,984,997
352 4,984,998
425 4,984,999
497 4,985,000
527 4,985,001
607 4,985,002
781 4,985,003
851 4,985,004

CLASS 440

000 4,985,005

CLASS 441

076 4,985,006
133 4,985,007

CLASS 446

308 4,985,008

CLASS 474

110 4,985,009
135 4,985,010

CLASS 475

278 4,985,011

CLASS 493

373 4,985,012
444 4,985,013

CLASS 501

5 4,985,375
22 4,985,376
51 4,985,377
89 4,985,378
104 4,985,379
128 4,985,380
136 4,985,381
155 4,985,382

CLASS 502

24 4,985,383
61 4,985,384
84 4,985,385
185 4,985,386
304 4,985,387
439 4,985,388
516 4,985,389

CLASS 503

208 4,985,390
4,985,391
211 4,985,392
216 4,985,393
226 4,985,394
227 4,985,395
4,985,396
4,985,397
4,985,398
4,985,399

CLASS 505

1 4,985,400
4,985,401

CLASS 506

148 4,985,038

CLASS 512

6 4,985,402
19 4,985,403

CLASS 514

6 4,985,404
11 4,985,406
19 4,985,407
25 4,985,408
46 4,985,409
54 4,985,410
63 4,985,411
70 4,985,412
79 4,985,413
008 4,985,405
100 4,985,414
118 4,985,415
150 4,985,416
155 4,985,417
179 4,985,418
211 4,985,419
4,985,420
212 4,985,421
215 4,985,422
219 4,985,423
220 4,985,424
222.2 4,985,425
241 4,985,426
242 4,985,427
248 4,985,434
249 4,985,443
252 4,985,428
253 4,985,429
4,985,430
255 4,985,431
258 4,985,432
4,985,433
260 4,985,441
277 4,985,435
4,985,442
287 4,985,436
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47 : 4,984,416
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51 : 4,984,556
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54 : 4,984,619
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55 : 4,984,403
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DESIGN PATENTS

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313,874
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313,882
08 : 313,714
313,797
09 : 313,750
313,760
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10 : 313,860
12 : 313,733
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13 : 313,827
16 : 313,699
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17 : 313,764
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19 : 313,823
20 : 313,865
22 : 313,788
23 : 313,767
24 : 313,745
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25 : 313,701
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313,872

26 : 313,720
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27 : 313,722
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36 : 313,700
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37 : 313,707
39 : 313,694
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41 : 313,723
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42 : 313,719
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55 : 313,752
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56 : 313,834

PLANT PATENTS

06 : 7,420

7,421

7,423

25 : 7,418

29 : 7,419

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